Canine and Feline Enrichment in the Home and Kennel: A Guide for Practitioners

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**INTRODUCTION**

**Definition of Enrichment**

Enriching a captive animal’s environment, whether the creature is captive in a zoo, a laboratory, or a home, should involve enhancing their quality of life by making life more rewarding and meaningful. This should be done in accordance with their natural behavioral needs so as to increase behavioral choices and encourage species-appropriate behavior.\textsuperscript{1}

**Goals of Enrichment**

The goals of enrichment are to enhance mental and physical development in young animals through the provision of a complex environment, and to ensure good welfare in adult animals by providing them with a complex environment that meets all their behavioral needs.

It is the role of the general veterinary practitioner to safeguard the welfare of animals and to ensure that the requirements of their 5 freedoms\textsuperscript{2,3} are met. In addition to the

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traditional veterinary role of safeguarding health and advising on appropriate nutrition, it is important for the veterinary practitioner to also consider their contribution to ensuring that animals have freedom from fear and distress and freedom to express their natural behavior. To this end, veterinarians need to engage with owners and with those caring for dogs and cats in boarding kennels or research facilities and in their own veterinary facilities to offer appropriate and practical advice regarding the issue of environmental enrichment. This term is perhaps more closely associated with zoos and other wild animal facilities but it is important to remember that our companion animal species also deserve to live in environments that enhance their quality of life and ensure good welfare.

CONSIDERING ENRICHMENT IN THE HOME ENVIRONMENT

When owners take on a pet, they may be prepared for the financial commitment in terms of veterinary care, food, and equipment, and may also have considered time input in terms of training, especially when they are taking on a dog. However, very few owners have seriously considered the possibility of adapting their household to meet the behavioral needs of their new family member and are at a loss to know what is important in terms of environmental enrichment. In order to better understand the environment that their pet requires they must first understand their species-specific requirements. This is of particular importance to cat owners, who have very little in common with their new pet in terms of social behavior and behavioral requirements. That does not mean that education of dog owners is not also important; in fact, better education regarding social interactions with dogs and their requirements in terms of play, exercise, and training would go a long way to preventing many of the behavioral problems encountered by the general veterinary practitioner.

MAKING A CAT-FRIENDLY HOME

Creating a cat-friendly home is a vital part of responsible ownership, but it is also a rewarding process and one that can be great fun for kitten owners at the start of their new relationship. It is also crucial that owners are educated regarding understanding of cat communication and body language so that they can accurately interpret signs of stress, relaxation, and pleasure in their cats. Providing an enriching home environment involves paying attention to the home itself but also needs to consider the outdoor environment immediately around the home. Cats have a fundamental requirement for a safe core zone within their environment to eat, sleep, and play. Within this core zone, provision of access to 3-dimensional (3D) space can help to provide for natural feline coping strategies of elevation and hiding. Cats need to fill their time budget with normal feline behaviors, such as marking and hunting; therefore, access to the outdoor environment is preferable wherever possible. When cats do need to be confined to the home, there is additional responsibility for owners to ensure that the indoor environment makes sufficient provision for the performance of normal feline behaviors. Confining cats primarily in an indoor environment is extremely challenging in terms of providing both appropriate mental and physical stimulation, and is not suitable for all cats. The domestic cat has descended from solitary wild cats and, although as a species they are highly flexible in terms of social organization and many individuals can adapt to group living, they are very sensitive to stress caused by social factors. Therefore, modifying the environment to ensure feelings of security is crucial, particularly in multicat households or in neighborhoods with high cat densities.
Enrichment of the indoor environment

- Space
- Resources
- Privacy
- Ability to perform normal behaviors

**Space**

Access to 3D space can significantly increase the size of the home in feline terms, and cats should be given lots of opportunity to climb and explore. Elevation and hiding are

![Fig. 1. Providing hiding places for cats is important.](image)

![Fig. 2. Allowing cats access to elevated locations is vital.](image)
important feline coping strategies that help in the regulation of stress. Therefore, provision of access to safe havens is an important feature of the cat-friendly home. The use of shelves, cat furniture, tops of cupboards, and wardrobes can all be effective. It is important to keep these areas clear for access at all times (Fig. 3).

**Resources**

Cats have a requirement for free and immediate access to resources and these include the following:

- Food
- Water
- Litter facilities
- Resting places
- Safe points of entry and exit from the territory

It is not just the number of resources but also the distribution that is important. Cats need to be able to select locations that offer privacy when they are eating, drinking, toileting, and resting and ideally they should not be forced to be in visual contact with any other cat when engaging in these activities. They also need to be able to access these resources without running the gauntlet of members of other feline social groups within the household or neighborhood.

**Privacy**

Offering a better distribution of resources increases the possibility of privacy within the home, but offering specific sources of privacy can also be helpful. It also may be

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Fig. 3. Elevated locations should be kept clear at all times.
helpful to use pheromone therapy to ensure that the available core territory is recognized as a safe and secure location.16

Privacy from outside cats is also vitally important and potential visual access from other cats into the home is a significant factor. It is important to position essential resources away from windows and glass doors (Fig. 4) and it may also be helpful to modify the outdoor environment to remove vantage points (eg, to prevent unfamiliar cats from staring in through a window). Ensuring the core territory is protected from physical invasion is essential. Free access flaps are very stressful because of the risk of invasion by other cats. Instead, owners should consider installing the microchip-operated flaps that provide enhanced security.

When multiple cats are restricted to the indoors, litter boxes must be located throughout the environment in such a way as to allow cats to access them without being forced into close contact with other household cats. Ideally, if litter boxes are placed in confined spaces, they should be accessible by separate entrances and exits so that cats can avoid each other whenever possible and litter boxes do not become a location in which one cat may lie in wait to ambush another cat.

**Ability to Perform Normal Behaviors**

Cats have some fundamental behavioral requirements that need to be met, including the ability to hunt, play, and scratch. Although social play between kittens is seen, play in adult cats is usually object or prey-target based and involves practicing hunting behaviors.17–19 If cats are given access to the outside world, many of these behaviors will be easily available in ways that do not cause any tension with owners or require any active effort on the part of owners. However, when cats have restricted outdoor access, whether part-time (such as being kept in overnight or while owners are at

![Fig. 4. This is a poor arrangement of resources, leaving the cat to feel vulnerable.](image-url)
work) or full-time, it can be important for owners to realize that these natural behaviors may need to be specifically catered for within the home environment.

There is a misperception among many cat owners that their cat needs a feline companion to ensure good welfare. Normal feline social groups consist of related females and are highly dependent on resource availability, and inappropriate introductions of unfamiliar cats can cause significant stress, particularly if individuals lack appropriate intraspecific socialization. Socially bonded cats can hugely enrich each other’s lives by allogrooming, allorubbing, and sleeping together (Fig. 5), but owners must manage introductions carefully for this to be a successful form of enrichment.

**Enrichment of the Outdoor Environment**

When cats have access to the outdoors, it is important to advise owners about ways in which they can enrich their gardens (yards) and surroundings and ensure that their cat’s freedom from fear and distress and freedom to express normal behavior is protected when they are out and about, as well as when they are at home.

- Providing accessible and significant scratching places
- Blocking access by other cats, both visual and actual
- Providing hiding places and vantage points
- Providing outdoor toilets

Editors Note: The authors of this article are British, and in the United Kingdom (as well as much of Europe), it is uncommon for cats to be restricted to the indoors, as is commonly done in the United States. Nevertheless, all of the basic principles of feline enrichment detailed in this article can and should be applied to the indoor environment, and, in fact, doing so should be considered even more critical for the welfare of the domestic cat confined to the indoors. Special fencing, specifically intended to keep resident cats inside of a yard and prevent access by stray cats, is widely available and can be used to provide cats with a safe and enriched environment in areas in which unrestrained outdoor access can be very dangerous.

**Providing Accessible and Significant Scratching Places**

Scratching is an important marking behavior in establishing a buffer zone for cats in multicat neighborhoods, and scratching sites should be provided at the edge of the garden for this purpose. Softwood posts are easy to install and owners can encourage cats to use them by rubbing the post against already-established scratch posts to gain

Fig. 5. Socially bonded cats provide great enrichment to each other.
familiar scents and scratching them with a wire brush to simulate scratch marks and attract attention.

**Blocking Access by Other Cats, Both Visual and Actual**

Traversing the territory of others is a normal feline behavior and is not particularly stressful, but when cats from another social group lurk in the territory or spend time resting within it, then stress levels rise considerably. If the intruder cat uses vantage points within the territory to observe and threaten the resident cat, more overt behavioral issues may arise, such as indoor marking. It is therefore beneficial to identify any vantage points used by other cats and block the view from these places into the home. This can be achieved by using a combination of plants, shrubs, sheds, and trellises. It can also be beneficial to make vantage points uncomfortable for cats to settle and rest within the garden. The use of long (8–10-cm) flat-headed nails that are spaced 4 to 6 cm apart along fences can help to stop other cats from resting, while still giving them the opportunity to traverse the garden while they are patrolling their own environment. Alternatively, spiky plastic door mats or intruder-deterrent plastic spikes can be used. Obviously, it is essential that owners do not use anything that could be dangerous for, or cause injury to, other cats.

**Providing Hiding Places and Vantage Points**

The resident cat needs easily defended resting places within its outdoor environment from which it can observe its surroundings and monitor the behavior of other neighborhood cats. It can be beneficial to fix shelves to fences or walls or even to place wooden platforms in trees so that the cat has elevated locations in which to rest. It can also help to clear shelves in an open garden shed so that cats can sit by windows and look out. The provided vantage points must face away from the house and into the garden so as to prevent other cats from using them to intimidate the resident when it is in the house. They should also be positioned in locations that prevent the resident cat from intimidating his neighbors in their houses. For cats living in very densely populated feline neighborhoods, it may be beneficial to provide hiding places and vantage points, which can be achieved by investing in planters, pots, and patio furniture. When cat flaps are being installed, they should be positioned so that the cat has shelter and privacy as it leaves the safety of the house. This can be achieved by the strategic use of patio furniture and potted plants and by ensuring that the cat flap does not open onto visually vulnerable locations (Fig. 6). Outdoor enclosures for confined cats should make use of the valuable 3D space to provide elevation and hiding places and also have visual barriers to prevent intimidation by other cats outside the enclosure (Fig. 7).

**Providing Outdoor Toilets**

In situations in which there is social tension among cats in the neighborhood, some cats can feel intimidated, making it difficult for them to access suitably secluded locations in which to toilet. For other cats, the garden simply does not afford suitable locations in which to site latrines, because of minimalistic garden design and lack of border areas with suitable top soil or as a result of the weather, which may result in flooding or freezing of appropriate sites. In these situations, it can be beneficial for owners to provide outdoor latrines that are positioned in safe and easily accessible locations. Preferably, these latrines should be at the periphery of the garden and in sites that are obscured by shrubs so as to offer privacy. When there have already been incidents of intercat aggression or where levels of intercat tension are very high, the latrines should be sited nearer to the house and the use of hooded litter trays can also be considered, although these may be too conspicuous for other cats. An alternative is to
make a sunken latrine by digging a hole 60 to 90 cm deep and 60 to 90 cm square, and filling the bottom two-thirds with pea-sized gravel for good drainage. Top up with soft white sand (playground type) and once the latrine is being used, start to scatter top soil over the sand. Use a litter scoop to remove feces and dig out and refresh the sand every 2 months. Sand latrines do not get waterlogged or frozen, so are available all year round. This is particularly relevant to cats who suffer from idiopathic cystitis, in which frequent urination is to be encouraged, in addition to controlling exposure to stressful situations (Fig. 8, Table 1).

Fig. 6. Using plant pots around the entry/exit point can provide important security for cats.

Fig. 7. An example of an outdoor enclosure with elevated resting places.
Fig. 8. Activity feeders can offer valuable enrichment for cats.

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<tr>
<th>Feline</th>
<th>Requirements and Examples</th>
<th>Conditions</th>
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<tbody>
<tr>
<td>Social</td>
<td>Cats can form social bonds but they are not dependent on social interaction for survival. Multicat household owners must be aware that their cats may be tolerating each other rather than being in the same social group.</td>
<td>The level of social interaction required by individual cats will vary and is dependent on socialization, experience, and genetics.</td>
</tr>
<tr>
<td>Physical</td>
<td>Three-dimensional space is highly important to cats that use elevation as a coping strategy when frightened. The environment should allow cats to climb, use vantage points, and to hide. Cats with access to outdoors will naturally exercise physically, but owners of indoor cats may need to provide opportunities for physical exercise, such as chasing toys.</td>
<td>The environment may need to be altered if older cats become less physically capable. Owners should remember that the 3-dimensional outdoor environment is just as important as the 3-dimensional indoor environment.</td>
</tr>
<tr>
<td>Mental</td>
<td>Predatory behavior is highly innate and can provide excellent mental stimulation for cats. Outdoor cats will find these opportunities themselves, provided the outdoor environment is suitable, but indoor cats need to be provided with appropriate prey targets, such as fishing rod toys. Activity feeders can enhance the life of indoor or confined cats.</td>
<td>If introducing mental stimulation as a new activity, ensure the cat is set up to succeed and then gradually make the challenge more difficult.</td>
</tr>
<tr>
<td>Natural</td>
<td>Marking (urine, feces, scratching, facial and flank marks), litter facilities, hunting, avoidance of threats through hiding and elevation, avoidance of other cats, vocalization, and so forth.</td>
<td>Owners may need reminding that their pet still has strong innate natural behaviors that need to be catered to.</td>
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<td>behaviors</td>
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MAKING A DOG-FRIENDLY HOME

Creating a suitable environment for dogs should be examined in a very different manner from that for cats. Dogs are social creatures, and for them the structure and layout of the physical environment is relatively less significant than the social environment (Figs. 9 and 10). Physical and mental stimulation should be met though provision of appropriate outlets for exercise and interaction with both the environment and social stimuli. It is also crucial that owners are educated regarding understanding of dog communication and body language, so that they can accurately interpret signs of stress, relaxation, and pleasure in their dogs (Fig. 11). Table 2 summarizes these requirements.

Enrichment for indoor environment
- Space
- Ability to perform normal behaviors
  - Social interaction
  - Mental stimulation
  - Appropriate opportunities for natural feeding strategies
  - Toileting opportunities
- Freedom from fear and stress
- Training

**Space**

Space requirements in the indoor environment will vary depending on size and activity level, which will be influenced by the breed and age of the individual dog. However, in general terms, dogs should be given access to as large an area as possible. Particular consideration should be given to choice. For example, with regard to resting areas, dogs may choose different locations to rest during the day and night depending on activity in the house or on temperature. Dogs also should have the opportunity to eat meals or chews/treats without being disturbed by passing traffic. This could be achieved by feeding them when the family is seated for a meal, or by allowing them access to an area where people will not be passing through at that time. Some owners choose to crate or kennel their dogs when they are unsupervised, and although strict rules exist for licensed establishments, pet owners are left to make their own judgments. Depending on the reasons for using such measures, dogs should be confined...
Fig. 10. Canine companions at play.

Fig. 11. This dog is showing mild signs of stress and owners must learn to recognize such signals.
for the minimum time possible. If a crate or pen is used, then there must be ample space for the dog to reach up, stretch, and turn around.

**Ability to Express Normal Behaviors**

Dogs are highly social, and unfortunately many owners enforce unnatural expectations onto their pets by expecting them to cope with long periods of social isolation from both humans and from conspecifics. There is no ideal requirement in terms of how long dogs should be left alone, and the recommendation for this should be the minimum that is realistically achievable. Full-time working owners may wish to employ a pet sitter, dog walker, friend, or neighbor to visit their dog during the day and, if their dog is well socialized to other dogs, considering canine company is also desirable. Dogs are also social eaters and it is normal for eating to be facilitated in the company of their social group, but this may need to be modified in households in which there is interdog tension or food guarding. Rules, such as ensuring the dog eats after the people in the household, are outdated and are not advised. Dogs that are appropriately socialized to humans, other dogs, and other species should be given ample daily opportunities to interact. Social enrichment is a necessity, not a luxury.

**Mental Stimulation via Play**

There is individual variation between dogs in the types of toys they find motivating and enjoyable. Some owners may say that their dogs are not interested in toys, but it is possible that they have not offered the dog sufficient variety. Novelty, particularly olfactory novelty, is an important factor in whether dogs show interest in toys. Other owners may say that they stopped giving their dog toys because the dog destroys them. Many dogs gain enormous enrichment by chewing and dissecting soft toys,

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<tr>
<td>Social</td>
<td>Dogs are an obligate social species and do not cope well with isolation. Opportunities for interaction with humans and canines should be provided. Humans must learn about dog body language to be able to effectively understand and communicate with their pets.</td>
<td>Dependent on socialization and experience.</td>
</tr>
<tr>
<td>Physical</td>
<td>Access to large safe areas to allow free running are important. Training a recall cue from an early age can allow owners to give their dogs plenty of freedom.</td>
<td>Dependent on breed, age, health status, and so forth.</td>
</tr>
<tr>
<td>Mental</td>
<td>Sniffing, social encounters, choice, reward-based training, problem solving (such as searching games, activity feeders, operant conditioning training).</td>
<td>If introducing mental stimulation as a new activity, ensure the dog is set up to succeed and then gradually make the challenge more difficult.</td>
</tr>
<tr>
<td>Natural behaviors</td>
<td>Scavenging, chewing, digging, vocalization, toileting, marking, social needs, physical exercise, and so forth.</td>
<td>Owners may need reminding that their pet still has strong innate natural behaviors that need to be catered to.</td>
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and if owners prefer not to spend money replacing these, they can provide their dogs with easily disposable enrichment, such as cardboard boxes or tubes with treats hidden inside. Appropriately socialized dogs will also gain significant enrichment through engaging in play with other dogs and with their owners. For dog-dog play, it is preferable for the dogs to be familiar with each other, so that they have mutual trust, to play in pairs, and be supervised to ensure fair play.\(^{26}\) Younger dogs may more readily engage in play with unfamiliar dogs\(^{27}\) and it is particularly important in this context that experienced supervisors intervene if one dog starts to intimidate another. Dog-dog play and dog-owner play appear to have different motivations, and it is therefore important in multidog households for owners to still ensure that they play with their dogs.\(^{28}\)

**Feeding**

Dogs became domesticated many thousands of years ago as they learned to scavenge for human leftovers around early village settlements.\(^{29}\) They have retained this omnivorous scavenging nature, and therefore an excellent way of providing enrichment is to feed dogs in a manner that requires exploration rather than from a simple bowl. This can be as basic as scattering kibble over the lawn or kitchen floor or can be more complex, involving homemade or commercial activity feeders (Fig. 12). Research on laboratory dogs in kennelled situations shows benefits of using activity feeders\(^{30}\) and it is therefore likely that similar benefits can be gained for dogs during confinement in a home situation. Meehan and Mench\(^{31}\) suggested that providing appropriate problem-solving opportunities to captive animals improved welfare. Dogs show social facilitation of eating, so eating at the same time as the family can be beneficial to their welfare, provided that there are no coexisting issues over food resource guarding.\(^{24}\)

**Access to Toileting Facilities**

Dogs that have been effectively house trained may become stressed if they are not given access to outdoors when they need to eliminate. It is therefore important that dogs have regular opportunities to access a suitable outdoor environment where they feel comfortable to urinate and defecate. Owners who are working full-time should be particularly aware of this requirement, and, as advised previously regarding social isolation, the help of a pet sitter or neighbor can be used. Some owners may choose to fit a dog flap, which allows their pet access to the garden or yard when needed.

*Fig. 12. Activity feeders are a great way to provide mental stimulation.*
**Freedom from Fear and Stress**

Depending on the history of the individual dog, in terms of genetics and experience, certain situations may cause fear or stress to that individual. Dogs may seek reassurance from their owners or they may seek hiding places. It is important that the individual dog’s coping strategy is recognized and supported. Owners with dogs that are experiencing fear or stress on a regular basis should be encouraged to seek referral to an appropriately qualified behavioral counselor (see further resources). Possibly most importantly those breeding and rearing puppies should be well educated about ways in which they can minimize development of fear-related behavioral responses with gentle human handling and good maternal care during the early weeks of the puppies’ lives.

**Training**

Training a dog is an excellent form of enrichment for improving welfare, particularly if operant conditioning methods are used that allow the dog a degree of control and encourage problem solving. Working with the dog to teach tricks, basic obedience, or higher-level tasks, such as agility or tracking, is also highly beneficial to the owner-dog relationship (Fig. 13). Owners should be actively encouraged to begin the training process early and to use reward-based methods and avoid aversives, which can be damaging to the pet-owner relationship and animal welfare, and increase the risk of aggression. Every case needs to be assessed on an individual basis, and if large gatherings, noisy environments, or close proximity of other dogs are sources of negative stress for an individual dog, the advice about training should be modified appropriately. Repeatedly attending stressful training situations can be detrimental and may even increase the risk of negative behavioral change.

![Figure 13](image-url)
Enrichment for outdoor environment
- Physical exercise
  - Reliable recall training
- Mental stimulation
- Toileting opportunities

**Exercise and Mental Stimulation**

Physical exercise is important for the general state of health and fitness but it also provides an important opportunity for mental stimulation for dogs. The type of exercise that dogs require will vary considerably between breeds and individuals and should be tailored to each situation. Leash walking alone may not be sufficient for the more active dog types, which generally require greater opportunities for more vigorous exercise, such as running. Some of the smaller dogs that have been bred purely as companion animals may be better able to cope with leash-only exercise but this is not ideal. Sniffing and investigation are highly driven natural dog behaviors and exercise must involve the opportunity for these activities. Simply taking a dog jogging or alongside a bike will provide for physical exercise but will not give these exploratory opportunities or appropriate opportunities for social interaction with conspecifics. Many owners choose to tire their dog out by repetitive ball throwing, which again results in physical fitness but does not provide the mental stimulation that could be gained from the dog exploring his own surroundings and can also create problems of excessively high arousal levels. Social interaction with other dogs can be a highly enriching activity for dogs that are appropriately socialized and this is particularly important for dogs in single-dog households.

**The Garden or Yard**

The garden or yard will vary in its importance for dogs depending on the level and type of exercise they are given out of the home and also the amount of time they spend in the garden. For dogs that are not regularly walked off lead, a safely fenced garden can provide a very important area for physical and mental stimulation. A visible boundary fence must be used, as unseen buried electric fences that activate shock collars can have serious adverse consequences (Karen Overall, unpublished case study discussion at IVBM Lisbon 2013). Some breeds show a greater tendency for digging behavior than others, but for individuals that are highly motivated to dig (Fig. 14), owners should consider providing an area of the garden that allows this activity. There are many causes of digging, including to bury and store food, as part of the hunting sequence, to create a cozy resting or cooling place, as part of play or exploratory behavior, or due to frustration or anxiety.

The amount of foliage present in a garden has been shown to be correlated with the amount of investigatory behavior seen in dogs, so increasing planted areas in a barren garden could provide improved enrichment. Different surfaces, such as grass, paving, gravel, and sand, can provide further enrichment. If dogs are left outside while the owner is out at work, then provision of appropriate shelter is essential, and issues of potential noise pollution in residential areas must be considered. Providing areas of safety for the resident dog and preventing exposure to repetitive challenges, in the form of people or other dogs approaching or passing the property, must be considered.

Play behavior has been seen to occur more when people are present in the garden, even in multidog households, so it is important for owners to spend time in the garden with their dogs. In fact, some dogs have little or no interest, and may even be more anxious when confined to the garden, unless accompanied by owners or other family
pets. Excessive barking and escape attempts are a cause for concern for the owners, neighbors, and the dog.

Feed and chewing opportunities can also greatly enhance the time a dog spends in the garden. Bones have been shown to keep a dog’s interest for longer (hours) than dry food dispensers (minutes) (Fig. 15, see Table 2).37

CONSIDERING ENRICHMENT IN THE KENNEL ENVIRONMENT

To assist in designing boarding or research kennel facilities, and maximizing the benefits of existing premises, it is useful to consider the following criteria:

- Space
- Toileting facilities
- Provision for appropriate species-specific stimulation

Fig. 14. Digging is important for some dogs.

Fig. 15. Bones last much longer than food dispensers.
• Freedom from fear and stress
• Ease of management and maintenance of hygiene

In addition to the preceding list, for dog and cat rehoming shelters it is important also to consider how the environment can affect rehoming potential through influencing the behavior of those animals. Although good welfare during their stay is clearly crucial, rehoming provides the most appropriate long-term welfare option for these animals.38

Spatial Requirements

The space requirements vary according to the species, the breed, and the individual, as well as on the duration of stay and the animal’s health status. There are written guidelines regarding housing of animals in both research and boarding establishments, and these must be adhered to. However, it should be remembered that these are the minimum standards and where possible exceeding these guidelines will be beneficial. Increasing pen size has been shown to increase activity in shelter and laboratory dogs.39–41

The amount of available space can be significantly improved for long-stay cats by providing variation of height within the pen, which also allows the cats to use their natural stress-coping strategy of elevation. Dog kennels need to be large enough for the dog to stand up, lie down, turn around, and sit comfortably, and when they are boarding for long periods or are in long-term research facilities, provision of larger areas that allow physical exercise also should be considered. Outdoor housing has been shown to increase activity in laboratory dogs and should be considered a beneficial enrichment.42

Toileting Facilities

When cats are confined in catteries or research facilities, it is important to provide them with toileting facilities that favor normal elimination behaviors. For boarding cats, it is also important to take into account the normal toileting facilities for that particular individual when it is at home.43 For this reason, the following criteria need to be considered:

• Adequately sized litter tray
• Suitable soft and rakeable litter (preferably one that is familiar to the cat)
• Sufficient depth of litter to allow for natural toileting behavior
• Provision of privacy where possible
• Adequate cleaning regimen

For dogs, it is important to ensure sufficient access to elimination sites that the individual considers acceptable. House-trained dogs may be very distressed if “forced” to eliminate “indoors” during their stay in kennels and may retain urine or feces for prolonged periods in an attempt to avoid soiling indoors. Dogs will learn substrate and location preferences for toileting and, depending on their individual experiences, may prefer to toilet on grass, paving, or gravel, for example.

Provision for Appropriate Species-Specific Stimulation

Both dogs and cats require physical and mental stimulation during their time in confined accommodation, and care must be taken to provide adequate and appropriate stimulation in relation to the species and the individual’s clinical condition. Visual access may be important for dogs by providing stimulation in the kennels,44 whereas the ability to hide is a prerequisite for cats, and visual access should be minimized.
Dogs are social creatures, and provision of human interaction is likely to be beneficial, although obviously this will be subject to the level of socialization and resulting fear responses of the individual. It also can be beneficial for dogs to be group housed rather than individually housed to enhance their welfare, provided they are socially compatible. If aggression arises only at feeding times, this might be the only time that access needs to be restricted (e.g., tie down, cage feeding). Cats, on the other hand, are not obligate social creatures, and provision of stimulation that is not people dependent may be preferable, particularly depending on their socialization history. Cats that are appropriately socialized with other cats may find interactions with their own species enriching, but this must be done with great care to provide a variety of heights and hides and sufficient space.

Stimulation opportunities should take into account natural species-specific behaviors and time budgets. Therefore, provision of opportunities for chewing, digging, and engaging in social interaction will be relevant for dogs, whereas for cats it is important to ensure opportunities for observing, patrolling of territory (by ensuring routes are passable), and climbing. Benefits also have been found through providing appropriate enrichment toys to individually housed cats in terms of increased physical activity.

**Freedom from Fear and Stress**

Frightened animals will often prefer to hide and, as long as it does not impair monitoring, offering a shelter within the enclosure may provide comfort for the frightened animal.

Segregation of species can be important in reducing fear and stress and this may be total, by using species-specific areas in catteries and boarding kennels, or partial, by using strategic use of barriers.

Sensory challenges should be evaluated in light of species-specific behavior to minimize freedom from fear and stress. Factors, such as metal pen doors, dogs barking within kennels, and cat transportation across the site, will need to be considered. On the other hand, appropriate auditory stimulation, such as classical music, has been shown to have beneficial effects on dogs in the kennel environment.

The use of pheromones within the veterinary and kenneled environment, both boarding and research, has been shown to be beneficial in terms of reducing anxiety in both dogs and cats.

**Ease of Management and Maintenance of Hygiene**

There is often a compromise to be made between the demands of the staff and those of the animals. Management necessitates clear visibility of the animals, but this must be balanced with freedom from fear and stress. Housing needs to be easily cleaned, but materials also need to offer comfort and low levels of auditory stress. Cost also must be taken into account, but animal needs, such as sufficient volumes of cat litter, should not be compromised.

**Personnel Requirements**

To maximize welfare in kenneled environments, it is important to pay attention to physical criteria relating to the pen sizes and structure, but the human element is also important, and ideally the personnel working within hospitalization wards should offer the following:

- Predictable temporal routine
- Unambiguous communication
- Appropriate handling and restraint
**Predictable temporal routine**
For animals undergoing medium-term to long-term stays in the kennel environment, the development of a predictable routine is important. Cats have been shown to have elevated physiologic and behavioral indicators of stress as a result of unpredictable management routines, and research has shown that unpredictability significantly increases the impact of negative experiences.7,52,53

**Unambiguous communication**
Consistency and predictability are important factors in controlling the negative effects of stressful situations, and consistent communication with animals being kept in confined environments is essential.

Try to avoid rushing interaction with the animals because of human time constraints, and remember that routine jobs, such as feeding and cleaning, are important activities that must be adequately addressed.

**Appropriate handling and restraint**
Most animals in the research environment require some type of restraint at some point during their time in the facility, but restraint can be easily misinterpreted as confrontation. Therefore, it is important to consider how we can ensure that every handling experience is as positive as possible.54,55 The requirements will vary according to whether the animal is healthy or is undergoing some procedure, but in either case, the methods of handling and restraint should aim to minimize suffering, both physical and mental.

Regardless of the species, chemical restraint should be considered if the animal is severely distressed, the procedure is painful, or the staff are at risk.

**Fig. 16.** Increasing 3D space in confined facilities.
With the availability of short-acting, safe anesthetic agents and reversible sedative agents, there is no excuse for brute force or animal suffering in place of appropriate chemical restraint. Medication must be appropriate. For example, the use of acepromazine alone for the purposes of handling and restraint does not address fear and anxiety. Time should be taken to acclimatize animals to necessary procedural interventions, reward training, and counterconditioning for procedures, such as carrier transport for cats, nail clipping, blood sampling (if required regularly), or otoscopic examination, and tolerance of the proximity of specific equipment should be instituted at an early age and carried out on a regular basis (Fig. 16, Table 3).  

**SUMMARY**

As general veterinary practitioners, we have a duty of care that applies not only to the physical health needs of the animals in our care, but also to their mental well-being. Advising clients about how to enrich their home and kennel environments is an important part of fulfilling that duty of care and will also enrich the relationship between the veterinary practitioner and client.

**REFERENCES**


