



RESEARCH

# A practitioner's guide to working dog welfare

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**Abstract** Research conducted by the Anthrozoology Institute and the Defence Science and Technology Laboratory has shown that many working dogs exhibit high levels of physiologic stress in response to kenneling (Hiby et al., 2006; Rooney et al., 2007a). Furthermore, these dogs tend to perform poorly during training, establishing links between welfare and working ability (Rooney et al., 2005, 2007b). Subsequently, we have been studying how kenneling affects welfare and working ability. Specifically, we have investigated which elements within housing and husbandry influence welfare, which of these seem to be the most important, and how environmental enrichment (e.g. feeding devices) can affect welfare and working ability. This paper draws together results from all of these studies, identifying signs that may be indicative of compromised welfare, and providing guidelines, based on scientific evidence, for how to improve kenneled working dog welfare. It reproduces an unpublished guide designed to primarily inform and advise practitioners who are responsible for caring for, and/or handling working dogs. This paper aims to ensure that practitioners are updated of the most recent advances in working dog welfare, and hence many of the studies summarized here are yet to be published in full, in peer-reviewed journals.

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## Introduction

Caretakers of dogs know that they must ensure that their dogs' physical health is optimal. But it is also important that they consider psychologic aspects of the well-being of the dogs within their care. Dogs are not particularly well adapted for life in a kennel environment; most find kennel life challenging and many experience compromised welfare (Hiby et al., 2006, Rooney et al., 2007a).

Many current working dogs were neither bred nor raised in kennels (Rooney et al., 2004) and for these the transition is especially stressful (Rooney et al., 2007a). Caretakers therefore need to take positive steps to ensure the highest possible degree of welfare in the dogs under their care.

## What is welfare?

There are various definitions of welfare, but it is now widely accepted that welfare is a characteristic of an animal, not something given to it, and that welfare can vary from very good to very poor. Welfare has both a physical and a psychologic component. To have good welfare an

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animal must be both physically fit and psychologically fulfilled. To assess an animal's welfare, one can pose questions such as:

- Does the animal exhibit signs indicative of suffering? (outcome-based measures) (Yeates and Main 2008);
- Is the animal healthy and does it have what it wants? (Dawkins, 2004); or
- Does the animal have the Five Freedoms (freedom from hunger and thirst; freedom from discomfort; freedom from pain, injury and disease; freedom from fear and distress; freedom to express normal behavior)? (Farm Animal Welfare Council, 1992).

Many kennel environments do not provide all that the animal needs (e.g., social contact, control over its environment, adequate exercise), and hence dogs may have difficulties coping with the environment and may experience negative feelings. An inappropriate kennel environment may also result in discomfort, pain, elevated levels of disease and distress, and may prevent a dog from expressing its normal behaviors. This is what we mean when we say that many kenneled dogs show poor welfare.

### Why is welfare important?

- Previous work has shown a link between measures of welfare and ability in guide dogs (Vincent and Leahy, 1997). Recent scientific research conducted by the Defence Science and Technology Laboratory (DSTL) and the Anthrozoology Institute (University of Bristol) has indicated that there is a link between welfare and working ability in explosives search dogs: stressed dogs tend to perform badly during search dog training (Rooney et al., 2005). In general, a happy dog makes a good worker.
- Poor welfare can lead to ill health (Clark et al., 1997) that may affect work output.
- Dog users have a legal and moral duty of care to maximize their dogs' welfare and minimize psychological suffering.
- Welfare is increasingly becoming an area of public concern. Independent reviews and public scrutiny are likely to intensify and we suggest that organizations would benefit from being proactive, rather than reactive, with regard to their welfare standards.
- There have been recent changes to legislation and a new Animal Welfare Act (United Kingdom Government, 2006) has recently come into force in the United Kingdom. Working dog establishments may no longer hold exemptions and hence may be compelled to meet the new legal requirements.
- Long-term stress can lead to a reduced ability to learn. Studies of long-term kenneled search dogs have shown a reduction in learning ability as early as 6 years of age, which may be linked to high stress levels (Hiby, 2005).

### Signs that a dog may be suffering

Accurate assessment of welfare is notoriously difficult, but incorrect assessment can result in animals experiencing unnecessary suffering. Therefore, the search continues for the most reliable, robust welfare measures for farm, laboratory, and zoo species as well as companion animals such as dogs.

Studies of military working dogs (Rooney et al., 2007a) and dogs housed at animal shelters (Hiby et al., 2006) have shown that individual dogs respond in different ways when they are stressed and so it is not possible to give a definitive list of signs. Below are some of the signs that carers may see. However, these signs will only be detectable if caretakers inspect and monitor their dogs on a regular basis. A dog's behavior varies significantly according to the time of day and dogs behave very differently when people are present as compared with absent (Gaines et al., 2007). Thus, the more time caretakers spend observing their dogs and the more varied the context in which those observations take place, the more accurate the assessment of their welfare will be.

### Changes in behavior

The changes in behavior that dogs produce in response to stress vary with the individual animal. Our research has shown that when first introduced to a kennel, some of the most stressed dogs become very inactive (Gaines et al., 2003). Those dogs that seem very quiet and spend most of their time lying down or sitting can often be suffering greatly. But other dogs, also experiencing high levels of stress, may show high levels of activity (e.g., walking and trotting) (Hiby et al., 2006). This shows how important it is to pay attention to individual dogs and note any changes in their usual behavior. It may also be valuable, whenever possible, to become familiar with dogs' behavior before kenneling so any changes can be noticed. A reduction in play behavior may also indicate compromised welfare (Boissy and LeNeindre, 1997; Fraser and Duncan, 1998; Yeates and Main, 2008). Other changes that may be symptomatic of poor welfare include sudden and unexpected aggression or fearful behavior.

### Emergence of fearful behavior

When under stress, dogs become highly aroused, and so may become excited or fearful very quickly. Events that a dog would normally react well to, such as some training situations and veterinary procedures, may now be perceived as threatening. This can lead to a dog showing fearful behavior such as cowering, licking its lips, raising its paw, avoiding eye contact, or hiding. Fear can also lead to dogs showing defensive aggression, and can cause bite incidents (Lockwood, 1995). Dogs with good welfare will usually be

less nervous and will cope much better with challenges; they are less likely to feel threatened or become aggressive to defend themselves.

### **Dogs self-mutilating or over-grooming parts of their own body**

Classic signs of self-mutilation are scratches or hair loss on the flanks, or sores on the top of the front paws and on the inside of the back legs. When dogs are stressed, they try to carry out behaviors that may relieve their feelings of anxiety. One behavior that dogs naturally find rewarding is grooming, and some may begin to groom excessively if they find that this is an effective way to relieve stress. Licking or nibbling, in response to an insect bite or small sore, can also become excessive if the dog is stressed at the same time. This can lead to hair loss, and then skin damage, in those areas that are groomed most often.

Using large plastic Elizabethan collars to stop dogs over-grooming can allow sores to heal, but it also prevents the dog from carrying out a behavior that it has been using to relieve stress. Hence it is important to give dogs the chance to carry out alternative stress-relieving behaviors, such as social interaction or chewing toys or food items.

### **Performance of stereotypies or repetitive behaviors**

Stereotypies are behavior patterns that are carried out repetitively and seem to have no obvious purpose (Mason, 1991). In kenneled dogs, typical examples are spinning on the spot, jumping up at the kennel walls, bouncing from wall to wall, and circling or pacing the perimeter of the kennel or enclosure (Hubrecht et al., 1992). These behaviors may have had a function originally, such as jumping up to be able to see out, but, due to kennel confinement, over time they become ingrained and are produced at a much higher rate than would seem necessary, especially when the dog is feeling excited or stressed. Studies have shown very high levels of these behaviors in working dog kennels, with between 46% (Hiby, 2005) and 93% (Denham, 2007) of the dogs in some establishments showing the behavior although at differing times of days and in response to varying husbandry events (Rooney et al., 2008).

Stereotypical behaviors are symptomatic of an underlying cause, and may not be problems in themselves. However, research has shown that they can lead dogs to damage their tails and to develop sore feet (Jennings, 1991) and lameness (Gaines, unpublished data). It has been shown that once an animal has developed a stereotypy or repetitive behavior, carrying out this behavior can actually relieve the animal's feelings of stress (Mason and Latham, 2004). It is important that the dog is not prevented from stereotyping

directly, because this could lead to the dog suffering even more. Instead, caretakers should try to relieve the dog's stress in other ways; in particular by allowing it the chance to carry out other rewarding behaviors, such as interacting with dogs, people, or feed enrichment devices (Gaines et al., 2008).

### **Shivering or cold body temperature**

During winter, outdoor temperatures often drop below freezing that can make the kennel environment extremely cold and uncomfortable. Our studies have shown that low temperatures can result in high levels of stress hormones in several breeds of dog (Hiby, 2005) and that dogs that live in heated kennels generally rest more (Gaines et al., 2005). For laboratory dogs, it is recommended that temperatures are kept within the range 10–26°C (Prescott et al., 2004). This should also be the case for working dogs. However, when this is impossible, caretakers should look out for signs that the dog is having difficulty coping with the temperature, such as shivering or coldness to the touch, and should adapt husbandry accordingly (e.g., increase bedding, provide coats).

### **Trembling or body shaking**

This behavior looks very similar to shivering in response to cold, but may occur when the dog is not cold, and it can be a sign of high psychological stress. It is often accompanied by fearful behavior such as cowering, hiding, and avoiding eye contact.

### **Paw-lifting**

While sitting or standing, a dog may pick up and hold one of its front paws off the ground (Prescott et al., 2004). Paw-lifting is carried out often when dogs are in conflict, or are confused, and are fearful of being punished (Schilder and van der Borg, 2004). In social situations, with other dogs or humans, this is an appeasement gesture and is often associated with anxiety, but it may also be carried out while alone in the kennel when a dog is very stressed.

### **Loss of weight**

High levels of stress can lead to physiological responses that raise metabolic rates, leading to fewer calories from food being stored and more used as immediate energy sources. Once the energy from recently digested food has been used up, the dog's body will begin to metabolize remaining fat stores, and will eventually break down muscle to release energy. Therefore a visible loss of weight or an inability to gain weight can be a sign of that a dog's welfare is compromised.

## Loose feces

Loose feces are very common within working dog kennel establishments, and in a study of 45 dogs at 8 different establishments, we found that over a quarter (28%) of dogs suffered at any one time (Gaines et al., 2005). Loose feces can be an indication of high levels of stress hormones, which if left unresolved can impair digestion and prevent uptake of essential nutrients. This can also lead to weight loss and a lack of energy in the dogs and consequently increased feeding costs for the establishment.

## Coprophagy

In a recent study of 120 working dogs at 8 different locations, we found that overall 18% of dogs were reported to eat their own feces; and within some individual kennel establishments the number of dogs carrying out this behavior was far greater (Gaines et al., 2005). Coprophagy can signal a nutritional imbalance, but can also be due to harsh treatment being used during toilet training, causing the dog to try to hide evidence of feces for fear of being punished (Wells, 2003). However, its presence in kenneled dogs may also be an attempt to create novelty in an otherwise understimulating environment and hence may indicate poor welfare.

## Soreness of the feet

Feet soreness can be caused by wet floors, and can also be an indicator of periods of intense activity when dogs stereotype within the kennel. Sore feet are often more prevalent in winter when the kennel floor remains wet or damp for most of the day (Jennings, 1991). Wet or damp floors soften the pads on dogs' paws and make them more susceptible to sores and splits.

## Vocalizations

Extended periods of barking, whining, or howling may be indicative of frustration or distress, and may lead to additional compromises in the welfare of other animals nearby, because the noise may prevent them from resting. Past research has identified noise as a welfare concern for dogs kenneled in rescue shelters (Taylor and Mills, 2007) and laboratories (Sales et al., 1997) and our recent studies have shown that in noisy military establishments, during the busiest times, resting is prevented, for example, when many dogs bark before feeding (Gaines et al., 2005).

## Chewing of the sleeping and/or transit kennel

Destruction is seen commonly in kennels as a result of dogs chewing door frames or protruding kennel edges. Similarly, dogs may destroy parts of their bedding or their

transit kennels. This behavior is costly, but is also an indication of an underlying welfare concern.

Kennel chewing may arise for several reasons: dogs that have great difficulty in adapting to the confinement of the kennel may try to escape, whereas other dogs may become distressed when separated from members of their social group and chew to try to gain access to them. Dogs may also find chewing rewarding in itself, as they are strongly motivated to chew objects to keep their teeth and gums in good condition, and in the absence of suitable objects, they may chew the kennel instead. Similarly to stereotyping, this behavior may help the dog to feel calmer. Stopping chewing directly can remove the dog's way of coping and may leave it more stressed. A better strategy is to provide the dog with alternative chew items, such as bones, chew toys, or Kongs (The Kong Company, Golden, CO), and to improve the dog's welfare generally.

## Ways in which to improve a dog's welfare

Below we describe some practical ways in which practitioners may be able to improve the welfare of the dogs within their care. In isolation, each of these changes may not make a big difference, but by implementing several changes, staff may be able to make significant improvements to welfare.

### Introducing dogs to the kennel environment gradually

Extensive research has shown that introducing dogs to a kennel environment for the first time is very stressful (Hiby et al., 2006, Rooney et al., 2007a). This stress can be reduced by gradual introduction to the kennel environment using a program involving positive rewards (Rooney et al., 2007a). This has been shown to be effective for puppies and is likely to be beneficial for older dogs too. When procuring dogs from certain sources, kennel habituation may not be possible, but whenever possible (e.g., when using regular suppliers) it is highly recommended. Selection, or breeding of individual dogs (or breeds) that have been shown to adapt well to the kennel environment, is a long-term strategy that also may help to minimize the stress experienced by dogs.

### Providing increased contact with handlers and caretakers

Research has shown that husbandry regimes and, in particular, the level of contact with people may be as, if not more, important than the physical kennel environment for the welfare of working dogs (Gaines et al., 2005), as well as for dogs in laboratory and rescue kennels (Taylor and Mills, 2007). Many working dogs were originally household pets and spent a large amount of time in contact with people. Once within the working environment, this level of contact



is not always possible, which can be stressful to the dog. Human contact is very rewarding for many dogs and so it is important that caretakers set aside time for interacting with their dogs. This will also help the dog to form close bonds that can in turn benefit its working relationships. Caretakers and handlers can increase the amount of contact with their dogs through activities such as grooming, playing, exercise, and petting, as well as training.

It is important to remember that not all dogs are confident with people. Dogs that are fearful of people may not initially benefit from human contact. However, time should be taken to slowly and positively introduce such dogs to people so that they can gain the benefits of human contact.

### **Avoiding leaving dogs alone for long periods**

Interaction with a person is often the high point of a dog's day. Dogs become attached to people with whom they interact regularly, and many dogs exhibit separation-related reactions and behaviors (indicating poor welfare) when their handler or caretaker is absent (Bradshaw et al., 2002; Fallani et al., 2007). Personnel should aim to spend as much time as possible with their dog, giving it regular exercise and interaction. They should try to visit it regularly while it is in kennels, and if they are away, should make provision for other staff to spend time with the dog.

### **Making the dog's routine predictable**

Animals cope much better in environments that they find predictable (Carlstead et al., 1993). In the case of kenneled dogs, this means a daily routine they can depend on, where rewarding experiences such as going out for walks, feeding, and working are guaranteed to happen, and people are consistent in the way in which they behave and train the dog. This can make weekends, holidays, and changes to shift patterns a stressful time for dogs, as they do not understand why the rewards they have learned to expect daily do not occur. It is therefore important at these times that staff make provisions to limit the changes to the dogs' daily routine. If it is impossible to provide exactly the same daily routine, then other rewards can be used to limit the effect (e.g., extra walks and exercise periods).

### **Pair-housing**

Laboratories, rescue societies, and several working dog agencies have had great success with pair-housing dogs. This requires careful planning and appropriate kennel design, but has been shown to greatly enhance welfare of both laboratory and rescue dogs (Taylor and Mills, 2007). Serious consideration should be given to the feasibility of implementation within other working dog agencies.

### **Providing time for free-running in paddocks or other areas, in pairs whenever possible**

Dogs are naturally keen to explore their environment and they live in a world dominated by smell (Fox, 1978). It is therefore very important that they are given regular opportunities to explore during off-lead exercise in both familiar and unfamiliar areas. Recent research on military working dogs showed that those dogs exercised less often, tended to rest less and stereotype, bark and visit the veterinarian more frequently (Gaines, 2008). In addition, dogs are social animals, with a great desire for contact with both humans and other dogs, so off-lead exercise either in pairs or groups can provide great benefits. There will, inevitably, be some individual dogs that do not interact well with other dogs. It is therefore important that dogs are introduced to one another with care, and that staff find combinations of dogs that interact amicably.

### **Making the kennel environment more interesting and comfortable**

#### **Adding sleeping platforms**

The majority of current kennel designs are very barren and offer little opportunity for dogs to carry out their natural behaviors. The addition of a sleeping platform can increase the complexity and available three-dimensional space. This can also provide the dog with a vantage point from which to carry out natural lookout behaviors that can be particularly important for smaller dogs, which may not be able to see out of the kennel without standing on their hind legs. Finally, platforms offer protection from a cold or wet floor, providing a more comfortable and warmer area to rest. Platforms are used extensively and have shown to be beneficial within laboratory kennels (Hubrecht, 1993) and rescue shelters (Taylor and Mills, 2007), are relatively cheap and easy to construct, and can be very useful for working dogs.

#### **Providing chew toys or bones**

Dogs are highly motivated to chew objects as this helps to keep their teeth and gums in good condition, hence most dogs find chewing toys (Wells, 2004) and bones rewarding and relaxing. There is a range of manufactured chew toys and bones on the market, which are relatively inexpensive and safe. However, not all dogs will be motivated by the same items (DeLuca and Kranda, 1992). For example, some dogs prefer meat-scented bones whereas others prefer rubber chews. It is important to try different types to ensure that all dogs benefit. Research has shown that the majority of dogs do not become possessive (Hiby, 2005; Gaines et al., 2008). Most possessive behavior is caused by fear, due to the dog having been punished previously for not giving up objects. This can be prevented by avoiding confrontation and by using distractions, such as taking the dog for a walk, or giving it another toy or food

treat when removing the chew toy. Dogs can also be trained to give up objects on command in return for rewards.

### **Giving Kongs filled with a suitable food**

Similarly to chew toys and bones, dogs often find food-filled (e.g., yeast or meat extract, or part of the daily food ration) Kongs (commercially available rubber cone-shaped toy) rewarding and relaxing, and begin to look forward to receiving them. It is very important that staff are predictable in their provision of Kongs—once this practice is started it should be continued on a daily basis, as changing the routine may cause the dog additional stress. Studies of German shepherd dogs and Labrador retrievers have shown that when dogs that interact regularly with Kongs have them removed, the dogs experience a significant increase in cortisol (Hiby, 2005) and many also show an increase in stereotypic behavior (Gaines, 2008). Previous studies and anecdotal reports have also shown that providing a Kong can actually prevent or reduce self-mutilation, probably by a combination of being a predictable reward, providing an alternative activity, and generally lowering stress levels. Working dog handlers and trainers often voice concern that the provision of devices such as Kongs may be detrimental to working ability. However, our recent research has shown that this is not the case. There was no measurable decrease in working ability when 8 dogs were given Kongs daily over a 4-month period (Gaines et al., 2008).

### **Providing bedding**

Bedding can be an effective way of insulating the kennel and making the dog more comfortable. If the dog is warmer in its kennel, it will rest more, it will not waste energy that could be used during work, and it should maintain a better body condition and weight. In addition, adding bedding can make the kennel more interesting. For example, straw adds new smells for the dog to explore, and some dogs spend time chewing and playing with fleece bedding. This can create additional work for husbandry staff and may increase costs, but it will significantly improve the welfare of the dog and should be given serious consideration.

### **Considering ways of increasing comfort during vehicle transit**

Most working dogs are transported regularly for both training and operational duties. Transportation can be very stressful for dogs (Kuhn et al., 1991; Bergeron et al., 2002) and it is important that the journey is made as comfortable as possible. Before any journey, staff should ensure that the dog has not eaten for at least 2 hours and that it has had an opportunity to defecate and urinate. Unless in transit to a veterinary hospital, the dog should only be transported if fit and well. Any transit kennel used should provide the individual dog with the space to stand with its head up, sit and lie

down in a natural position, and to turn around easily (Prescott et al., 2004). The vehicle should provide natural ventilation and careful consideration should be given when transporting dogs during the summer months. During transit, stops should be made at least every 4 hours and the dog given access to water and allowed to eliminate. Similarly to sleeping kennels, it is possible to further increase the comfort of transit kennels with the addition of bedding and toys, and the presence of a familiar item may help the dog to settle.

### **Modifying husbandry routines**

Establishments should give maximum priority to the dogs' welfare when planning husbandry routines. This encompasses many of the points raised already, such as ensuring predictability. In addition, caretakers should clean kennels in such a way as to avoid floor surfaces being wet for long periods of time. This may involve mopping off excess water or moving dogs to dry kennels during cleaning to avoid their feet being wet for long periods and to consider avoiding the use of strong smelling disinfectants that can be aversive to dogs.

Our research has also shown that dogs that are locked in a sleeping compartment while their kennel is cleaned, often bark and experience elevated levels of stress hormones (Gaines et al., 2005). This practice could result in fear and potential aggression and may be a safety, as well as a welfare, concern. Therefore, we advise moving dogs to another area, or scheduling exercise or training to occur during cleaning (Prescott et al., 2004). Husbandry routines should also be adapted for those individual dogs or breeds that seem particularly susceptible to the cold (e.g., German short-haired pointers). They should be provided with additional bedding, coats, or heating.

### **Striving for a positive relationship with the dog**

Giving a dog lots of rewards, not just food, but rewarding experiences such as walks, playing, grooming, or petting, can strengthen the relationship it has with its handler and/or caretaker. In general, the relationship between person and dog will be improved by positive interactions and broken down by negative ones (MacKellar, 2004). Human attention is very rewarding to dogs, hence controlling this attention and ignoring the dog may be all the punishment necessary to eliminate any unwanted behaviors. Several popular books provide examples of positive training methods (Pryor, 1999a).

### **Avoiding negative interactions and punishment whenever possible**

In a study of dog owners, we showed that dogs that are trained using more rewards tend to be more obedient, whereas those trained using positive punishment (defined as

the delivery of an aversive stimulus when a behavior is carried out) tend to exhibit more behavioral problems (Hiby et al., 2004). Dogs often misunderstand what they are being punished for, and make associations between punishments and something else in the environment or the person delivering the punishment. Punishment can also make dogs fearful (Schilder and van der Borg, 2004; Stafford, 2006) and anxious (O'Farrell, 1992), leading to decreased confidence, overexcitement, fear aggression (Roll and Unshelm, 1997), or a reluctance to try new behaviors for fear of correction. A recent study of 53 dog-owner partnerships has shown that this may impair future success when training a novel task (Cowan, 2007).

### Introducing dogs to potentially stressful situations in a positive way

Dogs can become scared of new experiences easily and form negative associations with places, procedures, or people. Hence, just as when introducing a dog to a kennel environment for the first time, any new situation must be introduced gradually (Bailey, 1995). Caretakers and trainers should start at a level where the dog shows no anxiety and then increase slowly, giving lots of rewards when the dog shows relaxed and positive behavior. The speed of progress will depend on the individual dog, but the aim should be to go slowly enough for the dog never to feel anxious or scared. If the dog does become anxious, the trainer should ignore this behavior and wait for the dog to relax before rewarding, then take a few stages back and begin to build up again. Training sessions should ideally always end with a positive achievement and reward (Pryor, 1999b).

An example of this process can be used when introducing a dog to a muzzle. The aim is to break the procedure down into very small steps: (1) showing the dog the muzzle; (2) letting it place its nose inside to retrieve a food treat; (3) increasing the time it has its nose inside in return for a treat; (4) moving the straps; (5) doing up the straps; and (6) keeping the muzzle on for short periods during enjoyable events, like walks. The number of steps and the speed of progress will depend on the individual dog. The aim is to progress steadily to avoid any anxiety or aversion, and reward all relaxed and positive behavior immediately. This will help the dog to associate the muzzle with pleasant events and stop it from being frightened when the muzzle is used at a later date.

### Introducing diet changes gradually

Pet food manufacturers and veterinarians recommend that any new diet should be introduced gradually, to prevent digestive problems such as diarrhea. This is relatively easy to implement in operational and long-term kennelled dogs, but it can be a problem for newly procured dogs. Whenever possible, procurers should request a 3-day ration of the

dog's current diet from either gift donors or rescue shelters. This would allow kennel staff to introduce the new dog to a new diet slowly, without causing stomach upsets. Guidelines for the gradual introduction of diets should be sought from a veterinary surgeon.

### Seeking further help

If efforts to improve a dog's welfare do not seem to be working, and caretakers continue to be concerned about its psychological well-being, they should seek professional help. Dogs that develop behavioral problems or abnormalities can often be helped by a trained professional, and staff should consult their usual veterinarian for referral. Help can be sought from pet behavior counselors, which in the United Kingdom are accredited by: the Association for the Study of Animal Behavior ([www.asab.org](http://www.asab.org)); the Royal College of Veterinary Surgeons ([www.rcvs.org.uk](http://www.rcvs.org.uk)); the Association of Pet Behavioural Counsellors ([www.apbc.org.uk](http://www.apbc.org.uk)); or the European College of Veterinary Behavioural Medicine ([www.ecvbm.org](http://www.ecvbm.org)). Some veterinary practices also offer behavioral treatment.

### Keeping up to date with future research

The University of Bristol and DSTL, along with other research groups worldwide, continue to work in the field of working dog welfare. Ongoing research is investigating what factors in the kennel environment have the most influence on a dog's welfare (Gaines et al., 2005) and we continue to examine the effects of altering various aspects of housing and husbandry on dogs' welfare (e.g., alternative exercise protocols). We aim to ultimately make recommendations about the optimum kennel design and husbandry practices.

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