

Improving the welfare of cats in animal shelters

Investigates the behaviour of cats in shelters as a key to improving their welfare.

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Introduction

The number of cats relinquished to shelters has been rising in recent years in the United States, with owners mainly citing house-soiling and destructive and aggressive behaviour (Lord *et al.*, 2006; Salman *et al.*, 2000). Current economic conditions also negatively affect animal adoption, with more cats living in shelters for longer (Weng & Hart, 2012). This review considers the cat's behaviour in different group compositions and in stressful situations and emphasises the importance of environmental enrichment for confined cats.

Discussion

A study by Gouveia *et al.* (2011) compared the behaviour of 46 domestic cats subjected to different lengths of time, room density (RD) and sex ratio in a shelter. The study group, 25 spayed females (F) and 21 intact males (M), was divided among four different size rooms. The cats' behaviour was assessed by one observer, who recorded duration and frequency of grooming, inactive behaviour, eating/drinking, friendly interactions, relaxed states, negative encounters and active behaviour.

Cats that had spent longer in the shelter were less active and ate less frequently and for shorter periods. These cats also spent significantly more time engaging in negative encounters (i.e., aggressive and submissive behaviours between conspecifics), perhaps due to stress as a result of the inconsistency of the group (Ottway & Hawkins, 2003). Each room held a maximum of 16 cats and new cats were allocated based on general health and availability of space. Stress is defined as being subjected to intrinsic or extrinsic demands that overwhelm an animal's resources to respond (Dantzer, 1991), resulting in physiological and behavioural changes (McEwen, 2000). Results of the study also showed that RD greater than 1 cat/2m² were positively correlated with a higher frequency of agonistic behaviours. This is supported by previous research, which recommends at least 1.67m² per cat (Kessler & Turner, 1999). A female/male ratio of 1-2 resulted in the highest rate of allogrooming and was associated with the least inactivity. Two of the rooms had female/male ratios of less than 1 and greater than 2 respectively. Allogrooming is beneficial as it helps redirect potential costly aggressive encounters (van den Bos, 1998b). However, the findings based on sex ratio are less reflective of normal social behaviour as the females were spayed. This study showed that cats kept in shelters for longer developed negative behavioural traits, which suggests reduced welfare. Hence, early adoptions should be promoted. However, more research is required to determine how well these behaviours reflect physiological stress.

The relationship between behavioural changes and adrenocortical response to stress was examined by Iki *et al.* (2011). Another aim of this study was to link the magnitude of the physiological response to the assessed feline temperament profile (FTP) of the cat. The FTP was performed on eight neutered male cats in 10 different situations to score their friendliness, interaction, play, sociability, adaptability and aggressiveness. An adrenocorticotrophic hormone (ACTH)-stimulation test was then conducted for each cat to ensure normal adrenal function before implanting a vascular access port (in left external jugular vein) for stress-free blood collection. The stress test comprised two identical phases of blood collection and behavioural analysis, with a three-minute spray bath as the stressor at 90 minutes. Throughout, the cat was held in the lap of one person with no active restraint.

An increase in plasma cortisol concentration for both ACTH stimulation test and stress test confirmed that the spray bath induced stress in the cats. Unfortunately, FTP did not differ much among them, possibly due to small numbers and the cats all being neutered male domestic shorthairs, 2.75 years old, so it could not be used to predict behaviours. The stress test elicited mostly resting behaviour, and avoidance behaviour. Interestingly, there was a negative correlation between these two behaviours, suggesting that cats will exhibit either aversion (resting) or active (avoidance) behaviours

when stressed. The stressor also resulted in a significant increase in self-grooming, previously found to indicate stress as cats often lick their own fur post-conflict in a stable colony (van den Bos, 1998a). Increased vocalisation and locomotion were also positively correlated with higher plasma cortisol concentrations. Increased vocalisation suggests a more reactive coping style, while increased locomotion suggests a more proactive coping style (Koolhaas *et al.*, 1999). These findings allow us to recognise stress-related behaviours for consideration when housing cats together, and further research into how temperament affects feline social behaviour would be useful.

Dantas-Divers *et al.* (2011) studied the relationship between agonistic behaviour and the use of resources that provide environmental enrichment in shelter cats communally housed. A total of 27 neutered cats were video recorded for four consecutive days to establish baseline behaviour and all agonistic (aggression and appeasement) behaviours were recorded. A puzzle feeder was then placed in the cats' enclosure for 1 hour on alternate days (to delay habituation). There was no significant correlation between weight, sex or coat colour on the rate of aggression. The cats were also not significantly more or less aggressive when the puzzle feeder was present. In general, the cats displayed a low rate of aggression, with avoidance and appeasement behaviours more commonly observed compared to overt aggression. They often displayed affiliative behaviours, such as mutual grooming and social play. This could be because the animals were all neutered and had been living together for three years (Crowell-Davis *et al.*, 2004). This study suggests that overt aggression is not a normal social behaviour in a group of cats to gain priority access to resources. This is done by controlling or preventing access by other cats to the resource. Hence, environmental enrichment should be used in shelters to stimulate exploratory and foraging behaviour, so increasing cat welfare.

Conclusions

Providing environmental enrichment and ensuring that the density of cats in communal housing is at least 1.67m² per cat improves cat welfare in shelters. By recognising feline behaviours in response to stress, shelter workers can make appropriate changes to reduce the stress, thus improving cat welfare. Shelters should also aim to promote early adoptions, since long stays in shelters result in negative behaviours that suggest decreased welfare.

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