

Recent advances in the welfare of domestic cats (*Felis catus*) in animal shelters

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Discusses recent developments with the potential to improve the welfare of domestic cats in shelters

Introduction

The number of cats admitted to Australian shelters is on the rise (RSPCA, 2015). Euthanasia is the fate of most cats admitted to shelters (Alberthsen *et al.*, 2013), and 17,398 cats were euthanized at RSPCA facilities in 2014-2015 (an increase of 12% on 2013-2014; RSPCA, 2015). Due to a lack of resources, feline immunodeficiency virus (FIV) positive cats – as well as many healthy and behaviourally sound individuals - are routinely euthanized (Crawford & Levy, 2007).

Discussion

For over two decades, point-of care antibody tests have been the mainstay for FIV diagnosis, due to their ease of use, low cost, and ability to produce rapid results (Hartmann *et al.*, 2007). However, these assays are unable to distinguish between antibodies produced in natural infection and those elicited by vaccination (Crawford & Levy, 2007; Levy *et al.*, 2004; Uhl *et al.*, 2002). More accurate diagnostic tests are available, including serology, CD4:CD8^{low} T-lymphocyte ratios, PCR and virus isolation (Crawford & Levy, 2007), but financial limitations and the sheer volume of admissions generally preclude their implementation in shelters. Consequently, FIV misdiagnoses could result in unnecessary euthanasia of FIV-vaccinated cats (Crawford & Levy, 2007).

Since the expiry of IDEXX's exclusive FIV test licence in 2009, several alternative assays have been released onto the market. Westman and colleagues (2015) recently evaluated the ability of the original SNAP FIV/FeLV ELISA (IDEXX) and two new immunochromatography assays to determine the FIV status of 119 FIV-vaccinated and 239 FIV-unvaccinated client-owned cats. The new Witness FeLV/FIV (Zoetis) and Anigen Rapid FIV/FeLV (Bionote) assays were able to discriminate between FIV-vaccinated and FIV-infected cats with outstanding sensitivity (100%, 100%) and specificity (98%, 100%). In contrast, all vaccinated cats tested positive with the SNAP FIV/FeLV ELISA, regardless of FIV status, resulting in an overall sensitivity and specificity of 100%

and 64%, respectively. Importantly, the inferior performance of the SNAP FIV/FeLV assay was directly related to the incidence of FIV-vaccinated cats in the cohort (33%), and is likely to vary geographically, depending on vaccination prevalence. By highlighting an accurate, economical and efficient algorithm for FIV diagnosis, Westman and colleagues study (2015) will ensure that shelters can afford to accurately test for FIV and avoid unnecessary euthanasia due to misdiagnosis. However, increased retention rates in shelters present the industry with another conundrum: it is more crucial than ever to ensure the welfare of cats during their stay and improve their adoptability, to make room for new admissions.

Prolonged shelter stays can compromise the emotional and physical wellbeing of cats (Gourkow, N & Fraser, 2006). Stress has a negative effect on immunity and can lead to reactivation of latent infections (Gaskell *et al.*, 2007). A recent study investigated the influence of positive human interactions on behaviour and health of cats rated as content on admission to an animal shelter (Gourkow, Nadine & Phillips, 2015). Treatment cats (n=47) were provided with ten-minute sessions of positive human interaction (petting, grooming and play), four times per day, for ten days. Control cats (n=49) were exposed to a person standing in front of their cage without interacting, for the same duration and frequency. A complementary study by the same investigators explored the effects of cognitive enrichment on the health and behaviour of cats rated as frustrated on admission to a shelter (Gourkow, Nadine & Phillips, 2016). Treatment cats (n=7) participated in four ten-minute training sessions per day for ten days, during which time they were conditioned to perform a 'high five' sequence, with a food reward for successful completion. Control cats (n=8) received no interaction and were ignored even during routine husbandry procedures. For both studies, response to treatment was assessed on the basis of a positive or negative interaction during training, daily mood (content, anxious or frustrated), faecal secreted IgA concentrations (as a proxy for mucosal immunity) and prevalence of upper respiratory tract (URT) disease.

The investigators found that contented cats given positive interaction were more likely to remain content and secreted higher concentrations of IgA than control cats. Control cats were more likely to become frustrated or anxious, secreted less IgA, and were 15.6% more likely to develop URT

disease than treated cats. Frustrated cats given operant training were more likely to become contented, secreted more IgA, and were significantly less likely to develop URT disease. In contrast, frustrated cats not receiving treatment were more likely to decline into apparent apathy.

Extended shelter stays can compromise feline health and welfare (reviewed in Gourkow, N & Fraser, 2006). When deprived of valuable resources such as positive human interaction, even content cats can succumb to learned helplessness (Gourkow, Nadine & Phillips, 2015; Kry & Casey, 2007). When selecting a cat, adopters consider behaviour the most important factor (Sinn, 2016), and attractive behaviours ('happy', 'playful') are associated with fewer indicators of stress in cats (Gourkow, N & Fraser, 2006). Gourkow and Phillips (2015; 2016) identify promising tools with which to improve the emotional wellbeing of frustrated cats, prevent the emotional deterioration of contented cats, and arm individuals with the immunological artillery to resist the respiratory pathogens which thrive in a shelter environment. The beauty of their approach is its simplicity and economy; no specialised equipment or financial outlay is required, and shelters could avoid the need for increased staff by utilising trained volunteers, making it a feasible implementation. Unfortunately, the behavioural assessments were not blinded in these studies, potentially introducing assessment bias, and the control treatment may potentially have been perceived as unusual or even menacing by control cats. However, the less subjective measures of response to treatment (faecal IgA and incidence of URT disease) were also significant, suggesting the study's findings are likely sound. The influence of operant training on frustrated cats is exciting and should be explored further.

Conclusions

Improved point-of-care FIV tests have the potential to decrease unnecessary euthanasia of vaccinated cats, but may place increased demand on shelter resources. Regular positive interaction can improve the health and welfare of shelter cats, increasing adoptability, and should form an integral component of animal care.

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