Factors affecting faecal glucocorticoid levels in domestic cats (Felis catus): a pilot study with single and large multi-cat households

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Abstract

Domestic cats (Felis catus) are widely believed to be highly sensitive to the effects of social stress, especially when living in high density populations. Cats are capable of adapting to living in a group, but this will often require opportunities for escaping and hiding. In this pilot study, adrenocortical activity, as a valuable physiological indicator of arousal underpinning potential emotional stress, was evaluated through the measurement of mean faecal glucocorticoid metabolites (mGCM) in fourteen singly and sixteen group-housed cats. Living conditions and ratings of the owners’ quality of life (evaluated from self-reported questionnaires) were used as factors associated with faecal glucocorticoid levels of the cats. A direct association between the scores of owners’ social dimension of quality of life and the cats’ mGCM was found for single cats only, with higher owner social scores associated with higher cat mGCM. No significant differences in mGCM were found between singly versus group-living cats. This suggests that the under-explored factor of owner lifestyle could play an important role in domestic cats’ day-to-day levels of arousal, especially when kept as single pets.

Keywords: animal welfare, cat, faecal glucocorticoids, feline, life quality, stress

Introduction

Domestic cats (Felis catus) are considered a social species (Crowell-Davis 2004). However, despite several examples of affiliative behaviour among conspecifics (McDonald et al 1987; Crowell-Davis 2004), as well as bonding with heterospecifics (Edwards et al 2007), they still retain independency, spending a great proportion of their time in isolation (Barry & Crowell-Davis 1999). Indeed, functional space occupation, together with distance communication, using both visual and olfactory signals (Beaver 2005), reflect a tendency to organise themselves spatially, controlling when and where contact with others occurs.

Depending on several conditions imposed by the environment in which cats are maintained, support for their social and spatial needs may not be possible, leading to increased arousal and distress. Unfortunately, most domestic cats are not chosen with consideration of their adaptability to live in confinement and near people (Jongman 2007). Densities of cats in private houses are commonly very high (Bernstein & Strack 1996), which does not permit dispersion. In addition, owners are responsible for composing the groups, which generally involves bringing together cats of different backgrounds, character traits and social status, which may be problematic. Some authors suggest that once living in groups, domestic cats form dominance hierarchies (van den Bos & de Cock Buning 1994; van den Bos 1998), a social mechanism that helps them cope with the impossibility of organising themselves spatially when confined. According to Leyhausen (1953), the more limiting the space for a cat group, the stricter the social hierarchy. The argument in favour of a social compensatory mechanism (ie organising themselves socially to compensate for the stress caused by spatial restriction) has been proposed recently by Lichtsteiner and Turner (2008) to explain the lack of increased stress levels (measured by urinary cortisol) among group-living cats compared with singly housed cats.

Domestic cats have great behavioural plasticity, adapting to a variety of environmental conditions either in complete isolation or as part of large groups (Kerby & Macdonald 1988). However, although there is a range of individual living styles, clearly not all cats are able to adapt to a given environment equally well. Evidence of this is the high incidence of behavioural problems in multi-cat households — eg urine-marking behaviour (Pryor et al 2001). Thus, despite the possibility of social stratification to prevent stress, higher arousal levels (measured by faecal glucocorticoids) may be seen in multi-cat households.