The effect of mirrors on the behaviour of singly housed male and female laboratory rabbits

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Abstract

It is widely recognised that single housing is detrimental to the welfare of social species. However, some experimental procedures dictate that laboratory animals are housed individually. There is evidence to suggest that, by mimicking social contact, mirrors are beneficial to the welfare of singly housed horses and heifers. However, experiments with singly caged laboratory mice have found mirrors to be mildly aversive. The present study investigated the behavioural response of singly housed male and female rabbits to a mirror in their cage. After a period of pre-trial behavioural observations, rabbits were provided with an acrylic mirror, either at the front or the back of their cage, for a period of seven days. This was followed by a post-trial period, at the beginning of which all mirrors were removed. Both sexes showed some changes in behaviour and in the use of space within the cage. The addition of a mirror significantly reduced grooming in females, which was previously considered to be at high levels. Both males and females showed an increase in investigatory behaviour, although the patterns of change differed between the sexes. Differences between males and females are attributed to differences in socio-sexual strategies between the sexes. It is concluded that, when single housing is unavoidable, mirrors might be appropriate to partially compensate for social contact in female laboratory rabbits. Further research using a wide range of welfare indicators is needed to establish whether the provision of a mirror could be used as a successful method of improving laboratory rabbit welfare.

Keywords: animal welfare, behaviour, laboratory rabbit, mirror, single caging, social isolation

Introduction

Rabbits (Oryctolagus cuniculus) are a naturally social species with social stability within the group maintained through aggressive chasing and submissive retreat (Mykytowycz 1958; Lehmann 1991). Despite decades of domestication, the rabbits’ social and sexual behaviour has changed little (Stodart & Myers 1964; Vastrade 1986; Lehmann 1991; Held et al 1995). An investigation by Chu et al (2004) found that pair-housed laboratory rabbits spent 26.7% of observed time in direct physical contact, indicating the social nature of the species.

According to UK Home Office statistics, in 2009 11,643 rabbits were used in 16,562 procedures (Home Office 2009); putting them in the top four most commonly used laboratory mammals. Female laboratory rabbits are often housed singly for experimental reasons, such as topical drug administration (to avoid interference/ingestion of drugs by conspecifics), a fast turnover of rabbits (which would result in the mixing of unfamiliar animals), as well as aggression (Seaman 2002). A review of the pharmaceutical industry in 1999 revealed that 100% of male rabbits were housed singly (Seaman 2002). Indeed, group housing of mature males is not advisable. Aggression is the major factor governing the housing of males and is also one of the reasons for housing female rabbits singly (Seaman 2002). Single cages also offer several benefits over floor pens, including increased hygiene, ease of monitoring individual health, efficient use of vertical space and ease of identification (Chu et al 2004). However, for highly social animals, it has been suggested that single housing can compromise welfare and it is therefore recommended that female laboratory rabbits be housed socially where possible (Morton et al 1993).

Experiments comparing group- and singly housed female rabbits have revealed marked differences in behavioural time budgets (Podberscek et al 1991; Chu et al 2004). Chu et al (2004) compared the behaviour of singly housed and pair-housed laboratory rabbits and found that singly housed rabbits showed a significantly greater rate of development of abnormal and stereotypic behaviours than their pair-housed counterparts. In a similar comparison, Podberscek et al (1991) found that stereotypic behaviours were only seen in singly caged rabbits, and totalled 6.3% of observed behaviours, compared to group-housed rabbits, which