Shelter choice by Syrian hamsters (Mesocricetus auratus) in the laboratory

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Abstract

The preference of Syrian hamsters (Mesocricetus auratus) for different in-cage shelters was tested. First, 15 males and 15 females were made to choose between a cage with a shelter and one without. Different shelters were tested consecutively: short (10-cm) or medium (15-cm) pipes made of black acrylonitrile butadiene styrene (ABS), 7.6 cm in diameter and open at both ends; and short or medium boxes made of black acrylic panels and open at only one end. The strongest use of the shelter cage for nesting (about 75% of days) was in the case of the medium open pipe, for both males and females. The strongest use of the shelter itself for nesting was also in the case of the medium open pipe (52% of days). A second experiment gave a choice between pairs of shelters (of seven different types) to 10 males and 10 females. Both sexes nested significantly more in a medium pipe closed at one end than under a wheel, and tended to nest more in that medium, semi-closed pipe than in a medium, open pipe. Also, females tended to nest more in the medium, semi-closed pipe than under an aluminium cover. Other pairings did not yield significant differences. Direct use of the shelters for nesting was rather low, except for the medium, semi-closed pipe (about 50% of days). Semi-closed ABS pipes are inexpensive, easy to clean, and do not interfere with running wheels, and they could be recommended as environmental enrichment for hamsters.

Keywords: animal welfare, environmental enrichment, preference test, sex differences, shelter, Syrian hamster

Introduction

Animal welfare is an important issue that has seen a rise in its study and application in the past few decades (Fraser 1999; Dawkins 2006). One definition of welfare is the provision of means so that a captive animal can still express a varied repertoire of naturalistic behaviours (Poole 1997; Galef 1999; Peace et al 2001; Van der Harst et al 2003; Sørensen et al 2005). Environmental enrichment, which can be defined as modifications to the environment that can increase the behavioural repertoire, is one way to improve the welfare of animals (Duncan 1978; Beaver 1989; Van de Weerd 1998a,b; Patterson-Kane 2002). The value that animals assign to different types of enrichment is often measured through preference tests (Sherwin 1996a; Würbel et al 1998; Würbel 2001; Olsson & Dahlbom 2002; Olsson et al 2003; Sørensen et al 2004; Stewart & Bayne 2004; Baumanns 2005; Sørensen et al 2005; Van Loo et al 2005) and these tests can sometimes be used to gain insight into the motivation of animals to obtain specific resources (Manier et al 1996, 1998b; Sherwin 2003; Jensen & Pedersen 2008).

One kind of enrichment is the addition of shelters, structures in which nests could be built and that could provide a refuge against light (especially in the case of nocturnal animals, such as most laboratory rodents) or conspecifics (Sherwin 1996a). Shelters have often been shown to be valued by animals (Ottoni & Ades 1991; Townsend 1997; Manser et al 1998a; Patterson-Kane 2003; Moons et al 2004), and they are amenable to preference tests. For example, Patterson-Kane (2003) found that rats (Rattus norvegicus) preferred shelters that were opaque, enclosed and made from solid materials. Other aspects can be studied as well. In mice (Mus musculus), for example, Van de Weerd et al (1998a) found strain and sex differences in the choice of shelters.

Syrian hamsters (Mesocricetus auratus) are often used in immunological, chronobiological and behavioural research. They are territorial and therefore usually kept in individual cages. In the laboratory, they are nocturnal and commonly build nests out of bedding or nesting material in which they sleep during the daytime, relatively exposed to view and to light. The nests, however, need not be in the open; they could also be built inside a shelter. Yet few studies have investigated the preference of hamsters for shelters. Kuhn (2002) recommended the use of U-shaped open shelters for these animals (three opaque surfaces, one at the bottom, one vertical and one at the top). Ottoni and Ades (1991) found that hamsters preferred to nest in glass bottles or plexiglass boxes that were, in an order of decreasing importance, darker, larger, and closer to resources such as food, water and nesting materials. Other structures have not been studied.