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Behaviour of growing rabbits under various housing conditions

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Abstract

The aim of this research was to assess the effects of environmental variables (group size, stocking density, floor type, environmental enrichment) on behaviour – as a welfare indicator – of growing rabbits. Two experiments were carried out with Pannon White rabbits. In experiment 1, 5-week-old rabbits ($n = 112$) were placed in cage blocks (2 m^2) with a stocking density of 16 or 12 rabbits/m^2. The cages (0.5 m^2) differed in the floor type (wire or plastic net) and in the presence or absence of gnawing sticks (white locust). The animals could move freely among the four cages through swing doors. Infrared video recording was performed once a week, the number of rabbits in each cage was counted every half an hour (48 times/day) during the 24 h video recording. Between ages 5 and 11 weeks the rabbits showed a preference towards the plastic net floor (16 rabbits/m^2, 62.5%; 12 rabbits/m^2, 76.5%; $P < 0.001$). Gnawing stick application significantly affected cage preference: 54.1% (16 rabbits/m^2) or 53.1% (12 rabbits/m^2) of the rabbits choose the enriched cages ($P < 0.001$). In experiment 2, the 5-week-old rabbits were placed either in cages (2 rabbits/0.12 m^2, $n = 72$) or pens (13 rabbits/0.86 m^2, $n = 104$) with 16 rabbits/m^2. The floor types were wire or plastic net, with the presence or absence of gnawing sticks on the walls. Video recordings were made at 6.5 and 10.5 weeks of age between 11:00 a.m. and 5:00 p.m. and between 11:00 p.m. and 05:00 a.m. Compared to cages, the rabbits housed in pens spent less time with resting (58% versus 67%) and more time with locomotion (6.7% versus 3.8%) but the frequency of aggressive behaviour (measured by the number of ear lesions) was also higher (0.14% versus 0.01%). In pens the application of gnawing sticks significantly decreased the frequency of ear injuries (0.05% versus 0.22%). The floor type did not affect any behavioural pattern (eating, drinking, movement, resting, comfort, social, investigatory) significantly. The main results showed that growing rabbits have a preference for plastic net floor and cages provided with gnawing sticks.

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The resting, locomotive and aggressive behaviour was modified by the housing system and the presence of gnawing sticks decreased the frequency of physical injuries.

Keywords: Rabbit; Behaviour; Group size; Stocking density; Floor type; Gnawing stick

1. Introduction

The ancestor of the domesticated rabbit, the European wild rabbit (*Oryctolagus cuniculus*), is a crepuscular animal and is mainly active during the dusk, night and dawn (Jilge, 1991). During the night the European wild rabbit stays mostly outside of the rabbit hole. Being a prey-animal its chances to escape from predators is higher during the night. The domesticated rabbit shows similar behaviour if kept similarly to its ancestor. However, if the rabbits are kept in cages their behavioural patterns change considerably primarily from the viewpoint of their activity, as consequence of the limited available space (Lehmann, 1987; Drescher, 1992; Stauffacher, 1992; Morisse and Maurice, 1997; Xiccato et al., 1999; Martrenchar et al., 2001).

Nowadays animal welfare raises interest world-wide. Housing the animals in large groups is believed to be one of the most important factors of well-being. Wild rabbits live in colonies including several adults and a lot of young rabbits together. In most intensive rabbit farms two or three growing rabbits are housed per cage. Searching for a better housing condition fitting the animal welfare aspects several authors compared the behaviour and production of rabbits in small cage and pens (larger groups) (Verga et al., 2006; Jordan et al., 2006; Szendrő and Luzi, 2006).

In a preference test Matics et al. (2004) demonstrated that young (3–4-week-old) rabbits like to huddle together regardless of the cage size. Comparing the behaviour of growing rabbits in smaller and larger groups (cage versus pen) Mirabito et al. (1999) observed that rabbits in smaller groups spent more time resting but the frequency of locomotion, exploration and social behaviour were higher in pens. Similar results were found by Martrenchar et al. (2001) in respect to resting, eating and interacting socially but the locomotory and abnormal behaviours were not connected with the housing system. In larger groups (60 rabbits) more running and hopping were observed by Postollec et al. (2003) than in smaller group (6 or 10 animals).

In spite of the several advantages of group housing some counter-arguments can be brought up: higher risk of infection and almost importantly the higher incidence of aggressive behaviour with the increasing age (beginning at sexual maturity at the end of growing period). Bigler and Oester (1996), Maertens and Van Herck (2000) and Princz et al. (2005a) reported higher incidence of aggressive behaviour and injuries on the rabbits in larger groups. Based on these findings Rommers and Meijerhof (1998) suggested slaughtering growing rabbits before the age of 80 days.

The effect of stocking density on behaviour of growing rabbits was examined in some experiments but there was a large range of group sizes.

Morisse and Maurice (1997) compared groups of 6, 7, 8 and 9 rabbits/cage (15.3, 17.8, 20.4 and 23.0 rabbits/m^2) and observed that behavioural patterns of rabbits at 6 weeks were only slightly affected by stocking density. At 10 weeks of age, social interactions, feeding and locomotory behaviour were reduced while an increase in resting, comfort and investigatory behaviour were noted when the stocking density was higher than 15.3 rabbits/m^2. If rabbits were housed two, three or four per cage (9.6, 14.3 or 19.2 animals/m^2), the frequency of resting was lower and of hopping was higher in groups of 2 than 3 or 4 rabbits/cage because lower number of