significant effect on forward reach. Inclining the barrier at up to 20° to the vertical significantly increased the reach. Splaying by 7° significantly increased sideways reach without permitting bullying, thus further increasing the volume of feed available.

However, tombstone barriers are of heavy construction because they are cantilevered. An alternative which overcomes this problem is the dovetail barrier. Extending the tombstones and supporting them at both ends, allows a lighter and simpler construction which can be made in timber of relatively light section with consequent cost savings. Observations of cows using the barrier on large-scale dairy enterprises have been encouraging.

Putting the wild back into zoos: enriching the zoo environment

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ABSTRACT

Zoo animals are often fed a highly nutritious diet requiring little foraging behaviour in an environment that remains constant for months or years. Consequently levels of foraging and exploratory behaviour are usually far below those of wild conspecifics. We describe two practical attempts to remedy these problems. Behavioural observations of a female kinkajou (*Potos flavus*) with a marked stereotypy were made on 6 days when the animal was fed from a tray and 6 days when food was hung around the enclosure to resemble the species' natural diet. Naturalistic food presentation resulted in an increase in foraging behaviour (3–51%) and a corresponding reduction in the frequency, bout-length and time exhibiting stereotypic behaviour (57.2–5.6%).

If regular small changes to animal enclosures resulted in beneficial behavioural changes, this would be a practical way of improving captive environments. In a study of eight individuals of three callitrichid species (*Saguinus imperator*, *Saguinus oedipus* and *Callithrix jacchus*), we measured the behavioural effect of simply changing a branch in the enclosure every week for 3 weeks. Observations were conducted over a 3-day period following each manipulation and compared with baseline data. Inactivity and high-level activity were significantly reduced as was social interaction. There was no evidence of habituation. Whilst these results are inconclusive, they suggest that quite simple manipulations can have significant effects on behaviour, some of which at least, can be interpreted as positive.

Individual variation in the stereotypies of caged mink

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ABSTRACT

One hundred and five individually housed adult female mink, fed once daily, were observed over 3 weeks. A stereotypy was defined as a rhythmic behaviour pattern with no apparent goal or function. Mink stereotypies are principally locomotory and vary in form and rigidity. One hundred and two animals performed them in the 8 h pre-feeding; individual scores ranged from 0 to 78% observations (mean = 48.1%). For 41 animals re-watched 1 year later, there was a strong correlation between 1988 and 1989 scores ($Z = 4.38$; $P < 0.001$). Sixty three animals, tending to be those with high pre-feeding levels, showed stereotypy after feeding. There is no relationship between pre- or post-feeding stereotypy and reproductive success or body weight (corrected for frame size); nor likelihood of vocalising at human disturbance; nor apparent hunger, as reflected in eating the bulk of food within a few hours of delivery. There was no clear relationship between stereotypy and forms of self-mutilation. According to these measures, highly stereotypic animals appear to be no less stressed or better in condition than other mink. This may mean that frequency is not the best measure of stereotypy; that stereotypy is not a coping response; that its causal factors are not seriously detrimental; that animals with low levels have alternative coping mechanisms; or that high stereotypers are more sensitive to begin with but fare as well as low stereotypers by using stereotypy as an "antidote".

Type of housing affects social and feeding behaviour of captive buzzards (*Buteo buteo*)*

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ABSTRACT

The animals used in this study were observed in captivity for a long time during recovery from injuries before their release. Their social behaviour was studied under two housing conditions: one group (20 animals) was kept in a $9 \times 9 \times 4$ m pen on the ground floor together with 10 individuals of different species but of similar size; another group (40 animals) was kept in a pen of equal size to the first, on the upper floor, with a lower level of disturbance by stockpersons. The intra- and interspecific interactions were recorded continuously in both groups. The Dominance Index (DI) was calculated for each individual. The interspecific interactions were more frequent than expected ($P < 0.001$) in the lower pen. On the other hand, intraspecific interactions were more frequent than in the upper pen ($P < 0.001$). A clear social hierarchy was hardly detected. High DI birds were likely to be intolerant towards approaching penmates, and fed on the perch, while low DI birds fed on the ground. Animals from the upper pen fed generally on the ground, while the opposite was observed in the lower pen ($P < 0.001$). Eleven animals out of the 37 sampled attacked a mouse when tested individually, with a slightly higher frequency among the animals of the upper pen. Predatory animals had a lower mean rank than non-predatory ones ($P < 0.025$). The low motivation to attack prey, shown generally by animals of the ground floor pen, could be owing primarily to the discomfort of animals subject to a high level of human disturbance. The DI does not reflect a social rank, but mainly the degree of social reactivity (or intolerance) towards the environmental or social stimuli, suggesting that high DI birds are not socially dominant, but more "stressed". This fact must be considered before their release.

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