Cost of fur farming -brief

The welfare of fur-farmed mink.

Captive animals may suffer if strongly motivated to perform activities that their housing does not allow. We investigated this experimentally for caged mink, and found that they would pay high costs to perform a range of natural behaviours, and release cortisol if their most preferred activity, swimming, was prevented. Mink on fur farms may thus suffer from frustration.

Fur farming is widespread in North America, Scandinavia and Europe, approximately 30 million mink pelts being produced annually worldwide. On farms, American mink (Mustela vison) are kept in wire mesh cages c. 0.9 x 0.4 x 0.3 m containing a single nest-box, and access to drinking-water and a paste-like food. Those opposed to fur farming claim that this causes frustration , as in the wild, mink would patrol territories 1-4 km long, use several nest-sites, and hunt by following scent trails, investigating burrows, and diving and swimming for aquatic prey . Others, however, argue that farmed minks' excellent health and breeding success show adaptation to captivity . We addressed this issue objectively by measuring the costs paid by farm-raised mink to acquire resources enabling natural behaviours. Because of the key role of pleasure in motivating choice behaviour this approach pinpoints activities important for welfare.

Eight male and eight female adult mink were individually housed in closed economy set-ups, each consisting of a conventional farm cage, plus seven similarly-sized resource compartments. These contained: 1) access to a water-pool beneath the cage, c. 1.5m x 0.5m, filled with 0.2m water; 2) a raised platform reached by a 2m vertical wire tunnel; 3) novel objects (e.g. discarded packaging, traffic cones, etc., changed daily); 4) an alternative nest-site (a wire box of hay); 5) toys for manipulation and chewing (e.g. tennis balls); and 6) a plastic tunnel; the seventh was left empty, to control for the importance of accessing additional space. Access costs were imposed by weighting one-way entrance-doors by 0kg, 0.25kg, 0.5kg, 0.75kg, 1kg or 1.25kg for seven successive days. Compartment-use was automatically recorded 24h/day, allowing calculation of four measures of value. The results are given in Table 1.

Using seven males and seven females, we then blocked access to each of four resources for 24 hours to record endocrine stress responses . These were behavioural resources of high, intermediate, and low value (the water-pool, alternative nest-site and empty compartment respectively), and an essential physiological resource: food. During each treatment, urine was collected for the assay of excreted cortisol; creatinin was also assayed to enable correction for differences in urinary concentration. When deprived of food, urinary cortisol increased by 50.0±16.1% over baseline levels (Paired $t = 2.77$, $df = 13$, $p < 0.05$); it also increased, by 33.8±11.2%, when access to the water-pool was blocked ($t = 2.75$, $p < 0.05$). These two effects did not significantly differ ($t = 2.47$, $p > 0.05$). Cortisol excretion did not increase in the other two treatments. Consistent with cortisol's metabolic functions8, when deprived of the food or water-pool, these responses correlated with increases in the animals' activity levels (Food: $R = 0.49$, $p = 0.07$; Pool: $R = 0.70$, $p = 0.005$; $n = 14$), although overall changes in activity only reached significance during food deprivation ($t = 2.45$, $df = 13$, $p = 0.03$).

Thus despite being captive-bred for over seventy generations4, raised from birth in farm conditions, and provided with ad lib. food, our subjects retained motivations to perform natural behaviours. Use of a water-pool attracted the greatest total expenditure, and had the highest reservation price, greatest consumer surplus measure of utility, and most inelastic demand. Preventing this also caused a cortisol response indistinguishable from that caused by food deprivation. These results suggest that caging mink on fur farms does cause frustration, particularly by preventing swimming.

621 wds

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Price Elasticity of Demand, widely advocated for assessing animal welfare 5, was calculated as the gradient of the log-log plot of visit price versus visit number for each resource 7 . Consumer Surplus, used by human welfare economists to assess resource value , was calculated by measuring the area under two types of demand curve: a plot of visit price versus visit number, analogous to the 'travel cost method' of environmental economists ; and an aggregate plot of price versus the number of subjects prepared to pay 9. Reservation Price 9, akin to the 'break point' of experimental psychologists, was calculated as the maximum price paid to reach each resource. Total Expenditure per unit time, as given precedence by behavioural ecologists , was also calculated, shown here for the six weeks of the experiment. All values are means and standard errors (n = 16) except for Aggregate Consumer Surplus. Low elasticities of demand indicate little decline in visit rate as visit costs increase; for all remaining measures, a high numeric value indicates a high usage value. (176 wds)

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