

Welfare through physical enrichment in captive red foxes (*Vulpes vulpes*) in the context of an oral rabies vaccine study

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Whenever testing oral rabies vaccines prior to licensure, foxes need to be housed under standardized experimental laboratory settings with a high biosecurity level for a long time-period. Little is known about the influences of such housing on fox behaviour and welfare. The aim of this study was to improve the welfare of single housed captive foxes. We provided physical enrichment to the foxes and tested their response. Two different items were provided sequentially and their short- to mid-term effects on the behavioural patterns were assessed. Data was collected from automated motion detectors and video recordings for several days for each individual. In general, physical enrichment increased the non-stereotypic activity of foxes for around one day, which may be an indicator for increased welfare. However, the increase of activity was specific for each item. After few days, animals seemed to habituate to the items. These results demonstrate potential positive effects of physical enrichments on activity patterns and indicate their potential for the improvement of animal welfare in foxes under experimental conditions. However, durations of such effects are temporally limited and efficient physical enrichment may therefore require the periodic introduction of novel stimuli to re-increase interest and maintain elevated activity levels.

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