

© 2013 Universities Federation for Animal Welfare
The Old School, Brewhouse Hill, Wheathampstead,
Hertfordshire AL4 8AN, UK
www.ufaw.org.uk

Animal Welfare 2013, 22: 357-368
ISSN 0962-7286
doi: 10.7120/09627286.22.3.357

Influence of environmental conditions and facility on faecal glucocorticoid concentrations in captive pygmy rabbits (*Brachylagus idahoensis*)

CD Scarlata^{†‡}, BA Elias[§], JR Godwin[†], RA Powell[†], D Shepherdson[‡], LA Shipley[§] and JL Brown^{*#}

[†] North Carolina State University, Raleigh, NC, USA

[‡] Oregon Zoo, Portland, OR, USA

[§] Washington State University, Pullman, WA, USA

[#] Smithsonian Conservation Biology Institute, National Zoological Park, 1500 Remount Rd, Front Royal, VA 22630, USA

* Contact for correspondence and requests for reprints: brownjan@si.edu

Abstract

The objective of this study was to determine if housing conditions, specifically pen size and soil enrichment, had an effect on faecal glucocorticoid concentrations in the endangered pygmy rabbit (*Brachylagus idahoensis*). The success of the captive breeding programme has been limited, so one hypothesis is that chronic stress due to sub-optimal housing conditions may be responsible for poor fecundity. Faecal glucocorticoid concentrations were assessed in 50 females housed among several pen types at two breeding facilities. The highest glucocorticoid concentrations were found in females housed in 0.37 m² crates as compared to enclosures ranging from 0.96 to 75 m² in size. Results also indicated that enrichment of enclosures with soil had a significant influence on adrenal activity, based on a reduction in glucocorticoid excretion for females moved from non-soil pens to those with soil. Last, a significant facility effect on glucocorticoid concentrations was observed, suggesting that factors other than housing influenced adrenal activity in these rabbits. In conclusion, based on measurements of faecal glucocorticoids, pygmy rabbits are best managed in enclosures that contain soil for digging burrows. Pen size had little effect on stress hormones, except for crates where limited space and/or absence of soil was associated with higher glucocorticoid concentrations. These results underline the importance of monitoring glucocorticoid concentrations in captive breeding programmes to identify optimal husbandry and management practices.

Keywords: animal welfare, captive breeding, environmental enrichment, faecal glucocorticoids, husbandry, pygmy rabbit