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# **Corticosterone responses of captive and wild northern brown kiwi (*Apteryx mantelli*)**

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2000

## Abstract

Conservation strategies should work to minimise the occurrence of stressful situations, which are likely to result in chronic elevations of corticosterone. Consequently, identification of such situations would yield important information for conservation management. The objective of this study was to compare the basal levels of corticosterone and the corticosterone response of kiwi (*Apteryx mantelli*) in different management systems. Repeated blood sampling enabled us to describe the magnitude and duration of the corticosterone response, which is a measure of the sensitivity of the hypothalamic-pituitary-adrenal (HPA) axis to stress. All kiwi responded to capture and handling with a rise in plasma levels of corticosterone, which peaked 30 min after capture. Corticosterone levels immediately after capture in wild kiwi were significantly higher than those of captive kiwi. This was most likely due to the method of capture, as wild kiwi took considerably longer to catch than captive kiwi. The plasma level of corticosterone 30 min after capture in nocturnal house kiwi was significantly lower than wild kiwi, but similar to those in outdoor penned kiwi. The cause of these differences is unclear. Nocturnal house kiwi may have become habituated to the presence of humans. Alternatively, it may be due to nocturnal house kiwi being held on a different light cycle to outdoor pen and wild kiwi. In addition, corticosterone levels in nocturnal house kiwi returned to basal levels 2 h after capture and handling. There was no significant difference in the binding affinity ( $K_d$ ) and binding capacity ( $B_{max}$ ) of corticosteroid binding globulin (CBG) between nocturnal house, outdoor pen and wild kiwi. Furthermore, at no stage did maximum plasma levels of corticosterone exceed  $B_{max}$ . Therefore, the  $B_{max}$  of kiwi CBG was not a major factor when interpreting corticosterone responses of kiwi. Regularly handled kiwi do not respond to public display and handling with an increase in plasma levels of corticosterone. Therefore, these kiwi appear to have become habituated to this procedure. Elevated corticosterone levels in wild kiwi immediately after capture indicate that determining the precise location of wild kiwi is sufficient to induce a stress response. Therefore this practice should be kept to a minimum. Low basal levels of corticosterone indicate that captive kiwi have acclimatised to captivity. Furthermore, these results indicate that captive kiwi are not exposed to chronic elevations in corticosterone.

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