Routine handling does not lead to chronic stress in captive green anole (Anolis carolinensis)

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Abstract

Routine handling has been shown to affect stress levels in a variety of animal species. This could result in a general decrease in welfare and may confound the results of scientific experiments or observations on captive study animals. In reptiles, there seems to be variation in the effects of handling on stress levels. Furthermore, most studies on reptiles only look at the effect of handling in the short term. In this study we quantified the physiological and behavioural impact of being held, twice daily, for 1 min at a time over a three-week period on the green anole (Anolis carolinensis). Measurements were collected at the end of the three-week repeated handling period. Our results showed no effect of repeated handling on body mass, tail-base width, heterophil to lymphocyte ratios (H/L ratios), behaviour and faecal corticosterone metabolite (FCM) levels for both males and females in the experimental treatments (‘handled’, ‘unhandled’). Our study animals did score very highly for several stress-indicating variables in the three weeks preceding the experiments — suggesting that they had experienced considerable stress during capture, transport and temporary housing in the pet store.

Keywords: animal welfare, captivity, green anole, handling, reptiles, stress

Introduction

Routine husbandry practices have been shown to adversely affect captive animals (Balcombe et al 2004; Morgan & Tromborg 2007). Even non-invasive manipulation, such as simply holding the animal, or cleaning or moving its cage, can affect the endocrinology, physiology and behaviour of animals. This could result in a general decrease in welfare (Morgan & Tromborg 2007) and may confound the results of scientific experiments or observations on captive study animals (Garner 2005). Balcombe et al (2004) provide an extensive review of the literature on the effect of handling in a variety of animal species (rats, mice, rhesus macaques, hamsters, rabbits, fruit bats and a number of bird species). The routine handling of laboratory animals induced changes in physiological variables, eg serum or plasma concentrations of corticosterone, glucose, growth hormone or prolactin, heart rate, blood pressure and behaviour. Changes from baseline or control measurements typically ranged from 20 to 100% or more and lasted at least 30 min or longer, showing that routine handling could have an effect on any measurements taken after the handling protocol itself. Besides the review by Balcombe et al (2004), which focused mainly on mammals and birds, a large body of work exists showing handling to also cause stress in fish (Farbridge & Leatherland 1992; Foo & Lam 1993; Hoffmayer & Parsons 2001; Ramsay et al 2009).

Besides this body of work on the effect of handling on stress in mammals, birds and fish, a number of studies have investigated this in reptiles (Table 1). There appears to be variation in the effects of handling on stress levels in reptiles (Table 1). While the majority of studies mainly find an increase in plasma corticosterone in response to handling, a number did not find an effect. Furthermore, almost all of these studies look at the effect of handling in the short term. Analyses of the effects of long-term repeated handling are rare for reptiles which is surprising given the fact that many reptilian species are kept in captivity for an extended period of time for research purposes and thus are frequently subject to routine handling. Therefore, in this study, we investigated the effect of three weeks’ repeated handling. While most studies focus on one technique of measuring stress (Table 1), we used an integrative approach to get a broader view of the response to handling.

In this study we quantified the physiological and behavioural impact of handling on the green anole (Anolis caroli-