

High levels of corticosterone in feather-plucking parrots (*Psittacus erithacus*)

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FEATHER plucking, the causes of which are thought to be varied, is a common problem in parrots. A number of physical causes have been linked to feather plucking, including infections with viruses such as polyomavirus and irritation caused by mites and lice (Coles 1997). A large proportion of feather plucking, however, is thought to be psychological in origin. Such stereotypic behaviour might be a response to stress caused by, for example, boredom arising from lack of environmental enrichment or a lack of interaction with conspecifics. The evidence linking stereotypic behaviour with poor welfare is well known (Lawrence and Rushen 1993). Mason and Latham (2004) reviewed 286 published reports on stereotypic behaviour and concluded that environments that induce or increase such behaviours are worse in terms of welfare than those that do not. It would, therefore, be reasonable to predict that feather-plucking parrots should have higher levels of stress. However, there are also suggestions that feather plucking is merely a habit; the origin of the plucking may be physical, for example, induced by ectoparasites such as feather lice (Mallophaga) (Coles 1997), but when the physical problem is remedied the animal continues to pull feathers out of habit.

Faecal corticoids are a useful non-invasive tool for the assessment of stress in birds and other animals (Shepherdson and others 2004). Faecal corticosterone has been demonstrated to increase significantly after the administration of adrenocorticotropic hormone to mourning doves (*Zenaidura macroura*) (Washburn and others 2003), Adelie penguins (*Pygoscelis adeliae*) (Nakagawa and others 2003) and domestic fowl (Dehnhard and others 2003). Stressful situations have also been shown to increase faecal corticosterone levels in dickcissels (*Spiza americana*) (Wells and others 2003). This short communication describes a study to measure the steroid hormone corticosterone in the faeces of two groups of African grey parrots (*Psittacus erithacus*).

Two groups of parrots were studied: group 1 comprised seven birds suspected of having psychological feather plucking, while the 10 birds in group 2 had no evidence or history of feather plucking. Faecal samples were collected from the feather-plucking and non-feather-plucking parrots. The feather-plucking parrots were housed domestically, while the control birds were housed together in a large aviary. The faecal samples were dried at 25°C, extracted with 80 per cent methanol, reconstituted in phosphate-buffered saline and assayed using a fully validated commercially available corticosterone ELISA.

As predicted, there were significantly higher corticosterone levels ($P=0.032$) in the feather-plucking parrots (mean [se] 261 [83] ng/g) than in the control parrots (75.1 [15.6] ng/g), as determined by the one-tailed Mann-Whitney U test (Fig 1). The levels of corticosterone in the control birds were similar to those found in birds in other studies (Dehnhard and others 2003, Hartup and others 2004), while the feather-plucking birds had corticosterone levels four times higher than the controls.

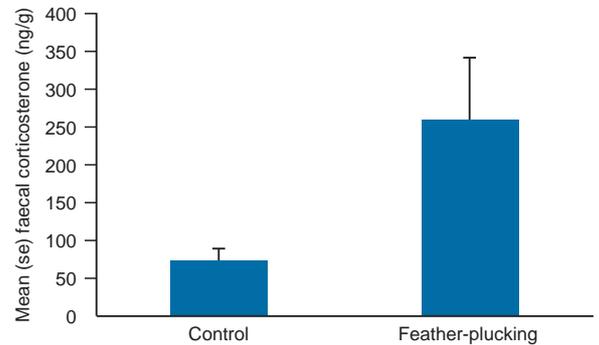


FIG 1: Faecal corticosterone levels in the faeces of 10 control (non-feather-plucking) and seven feather-plucking African grey parrots (*Psittacus erithacus*)

These results indicate that feather-plucking parrots have higher baseline corticosterone levels and suggest that they do indeed have higher chronic stress levels than non-feather-plucking parrots. Many factors could contribute to this stress: for example, housing conditions, lack of interactions with conspecifics, the effect of hand-rearing versus parent-rearing, environmental enrichment and physical health. Such variables need to be investigated systematically in order to determine the causal factors.

This study demonstrates that feather plucking in parrots can be related to stress levels, and that this can be effectively determined in these birds using a non-invasive method.

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