

Different responses of free-ranging wild guanacos (*Lama guanicoe*) to shearing operations: implications for better management practices in wildlife exploitation

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Abstract

*In certain areas of South America, free-ranging, wild guanacos (*Lama guanicoe*) are exploited for fibre by local people. This activity includes the capture and handling of animals which can adversely affect their behaviour and physiology. This study investigated the behavioural and physiological responses of guanacos to shearing and handling activities in order to obtain a better picture of the welfare state of individuals. Parameters that were assessed consisted of: time enclosed; handling time; sex; age; and vital signs (heart beat frequency per minute, respiratory rate per minute, body temperature and body condition). Blood samples were also collected to measure serum cortisol levels and neutrophil/lymphocyte ratios. Frequencies of spitting, kicking, escape attempts and vocalisations were recorded as behaviours considered indicative of stress. Our results showed that stress behaviour frequencies were higher with increased handling time, whereas serum cortisol and N/L levels were higher when body condition scores were low. Handling time should be kept as short as possible to minimise individuals' stress levels, particularly when body condition is low. Stress behaviour rates and serum cortisol levels were higher in juvenile compared to adult guanacos. Finally, both physiological measures of stress — serum cortisol concentrations and N/L ratios — were higher during the management activities of 2010 than in 2009, which may have been as a result of more inclement weather in 2010. When managing guanacos, it is important to consider both animal traits and previous environmental conditions and to avoid shearing juveniles and individuals with poor body condition scores if weather conditions are severe. These management recommendations are likely to improve animal welfare, facilitating sustainable management of this wild and emblematic species from the desert biomes of South America.*

Keywords: animal welfare, handling, *Lama guanicoe*, neutrophil/lymphocyte ratios, serum cortisol level, stress behaviours