

Comparison of behaviours and vocal signals of alpacas during handling and painful stimuli

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Alpacas are domestic camelids native of South America. They are raised in farms in Chile, Argentina, Peru and Bolivia, however recently they are also being bred in several European countries, New Zealand and the USA. Despite the marked interest for this type of livestock, the knowledge of their welfare is scarce and behavioural signals are not well understood. Alpacas communicate emotions through body postures and a wide variety of vocalizations; nevertheless, it is not clear whether they are related to stress or pain response. The aim of this study was to compare body postures, behaviours and vocalizations of alpacas between handling procedures and during the administration of two injections, as part of a veterinary program. This study was conducted in a farm and 32 alpacas were included. During handling, each alpaca was separated from its group and taken to a management pen (MP). The study was in three stages: (1) HANDLING, from the time each alpaca was in the MP until they were physically restrained; (2) PAIN STIMULI, when they were injected; (3) POST PAIN STIMULI, when they were released in MP and before they were returned to their groups. The frequency of spitting and tail-up were recorded as behaviour and posture; the frequency of humming, grumbling and screaming were recorded as vocalizations. Acoustic parameters were recorded with a microphone Sennheiser® ME-66/K6, connected to a digital recorder Tascam DR-100 MKII®. The audio files were analysed using the software Raven Pro® 1.4. We measured duration and time to maximum amplitude (s) and spectral characteristics of acoustic signal, dominant frequency (Hz) and number of harmonics of acoustic signals. Friedman test was applied to compare behaviours between the three stages, and ANOVA was conducted to compare bioacoustics parameters. We found that only the frequency of humming was higher during handling than during painful stimuli ($\chi^2=12.25$, $P=0.02$). The frequency of grumbling, screaming, tail up and spitting was not affected by the painful stimuli ($P>0.05$). The same was found regarding the bioacoustics parameters ($P>0.05$). We can conclude that, in the handling context, humming is a indicator of stress and the remaining parameters do not allow to distinguish between stress and pain response.