

Summary

The concept of virtual fencing (VF) involves keeping animals within a designated area without the use of a physical barrier. The aim of this dissertation was to determine whether self-applied sound signals (without association with electrical impulse) have the potential to create virtual grazing fences for horses and to investigate the influence of selected factors on the effectiveness of this barrier. The study material consisted of a total of 50 adult warm-blooded horses. Several behavioural tests were conducted to assess 1) the influence of novelty effect and sound origin type (anthropogenic, predatory and non-predatory animals, inanimate nature) on the triggering of the anti-predatory response and the degree of threat perception, 2) the importance of the level of motivation to acquire specific resources and the sound exposure distance (the strength of the surprise effect) on the effectiveness of the sound barrier and the emotional arousal of horses, and 3) the variation of responses to sound according to individual horse characteristics and the context of sound appearance. The time and frequency of various behaviours were analysed, mainly indicating increased vigilance and avoidance of the auditory stimulus, the number of points for reaction to sound awarded based on an established scale, latency time, the heart rate (HR) and heart rate variability (HRV) of the horses (RR, RMSSD, HF, LF, LF/HF parameters). Sudden and unexpected sounds were shown to influence the triggering of the anti-predator response in horses, indicating some potential for auditory stimuli to create virtual fences. Only few sounds were perceived as threatening (behavioural-physiological response) and the effect was a combination of unpredictability and novelty effect. A key factor modifying the effectiveness of the sound barrier is the motivation to acquire specific resources, reduced significantly for social motivation. Social dependence masks the auditory stressor effect, indicating the importance of the social group as a buffer. The effectiveness of auditory cues is therefore too low to create independent virtual barriers. However, the use of sounds as additional reinforcement of impermanent physical solutions cannot be excluded, but this requires further research. Due to the emotional arousal of horses, a sufficiently large distance would then have to be included, beyond which the sound would be triggered.