A preliminary study into the use of infrared thermography as a means of assessing the horse's response to different training methods

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Infrared thermography (IRT) has been used as a non-invasive means of assessing stress responses in animals. Changes in surface temperature that relate to redirected blood flow have been associated with emotional responses in a range of species. For example, when horses were subjected to a sham clipping procedure, increases in eye temperature were found to correlate significantly with increases in salivary cortisol. The Pessoa Training Aid is claimed to enhance the physical development of the horse but may also increase the psychological stress associated with training. The aim of the current study was to use IRT to evaluate whether the use of this training device affected the stress response of horses during a lunge session. Riding school horses (n=8) were used for the study. All had previously been lunged in the Pessoa. Each horse was lunged for two sessions of approximately 15 minutes, once with and once without the Pessoa using a cross-over design. In each session the horse was lunged on both reins at walk, trot, canter, trot and walk. With the Pessoa the horse was lunged initially with the device fitted loosely and it was only tightened for the second trot. Thermal images were taken from a distance of one metre after each gait and from each side of the horse using a Mobir GuidIR M4 thermal camera. Ambient temperature was also recorded. A digital rectal thermometer was used to measure core temperature. Thermal images were analysed using Guide IR analyser software. The same area around the eye, on the neck and around the ear was circled on each image and the maximum temperature recorded. Mean temperatures (eye, ear, neck and core) were calculated for each gait with and without the Pessoa. A two-way repeated measures ANOVA was carried out on the mean temperatures to assess the effects of Pessoa and gait. Significantly higher eye temperatures were recorded with the Pessoa (30.59 ±0.58°C) than without it (28.7±0.83°C) ($p<0.05$). There was also a significant effect of gait ($p<0.01$), with the highest eye temperature being recorded following the second trot when the Pessoa was worn (32.34±2.61°C) and the lowest at halt (27.5±0.95°C). There was no significant effect of either gadget or gait on ear or neck temperature. Significantly higher core temperatures were found when the Pessoa was used (with: 37.11±0.2°C; without: 36.7±0.17°C) although this was not affected by gait. No correlation between ambient temperature and eye, ear or neck temperature was found. The results of this preliminary study indicate that the horses experienced more stress when lunged with the Pessoa than without it. The increased eye temperature that occurred in relation to gait and was highest after the second trot was accentuated by the use of the Pessoa following tightening of the device. The use of IRT offers an objective non-invasive method of assessing the horse's response to other training methods and a means of improving the welfare of the ridden horse.