

Inducing positive emotions: cardiac reactivity in sheep regularly brushed by a human

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Welfare concerns the absence of negative and presence of positive experiences. We assessed cardiac indicators of sheep through a heart rate monitor, as well as ear postures and tail wagging. Thus, 38 female Romane ewes were trained to be brushed by a familiar human (B) on the neck, withers, chest and belly, or exposed to human presence (H). The ewes belonged to two lines: more (R+) or less (R-) reactive to social isolation. Heart rate (HR) and heart rate variability (RMSSD, RMSSD/SDNN and LF/HF ratios) were analysed using linear models. The models considered treatment, genetic line and phase (pre- (2.5 min), during (3.0 min) and post-exposure (2.5 min)) as fixed effects, including their interactions. The HR during and after brushing was lower than before brushing ($P < 0.01$). No differences in RMSSD were found, but the RMSSD/SDNN ratio during the exposure was higher than before or after ($P < 0.05$). The RMSSD/SDNN ratio in R- ewes was higher than in R+ ewes ($P < 0.01$), revealing a stronger activation of the parasympathetic system in R- sheep. In R+ line, the B ewes had a higher HR than the H ewes ($P < 0.01$) whereas in R- line the difference was reversed ($P < 0.01$). In R+ line, the LF/HF ratio of the B ewes was lower than in the H ewes ($P < 0.01$). Preliminary results on ear postures also indicate a positive perception of brushing, as sheep showed a higher duration of horizontal ears, equal to 105.82 (0/178.63)s, and wagged their tails for 28.83 (0/151.60)s when brushed. The H ewes performed raised up ears for longer, equal to 60.22 (11.12/171.32)s, and wagged their tails for 1.14 (0/8.68)s. Such behavioural variables will be further analysed. There is a need to better investigate the differences between R+ and R- before concluding that the emotional reactivity can modulate the autonomic responses to positive events.