a brain region central to learning and memory. In this experiment, we aimed to investigate the link between the basal level of stress hormones, measured as faecal cortisol metabolites (FCM), and performance and heart rate (HR) in a learning test, performed under either calm (home environment) or stressful (novel environment) conditions. Twenty-five geldings (2 or 3 years old) pastured in one group were included in the study. The horses were relatively unhandled prior to the study and were initially habituated to leading and being stroked with a whip on the body. Faeces was collected twice on control days where the horses had been undisturbed at pasture for 48h. The learning test was based on negative reinforcement and performed by a professional trainer. The test included five predefined stages during which the horses were gradually trained to move sideways by crossing their front and hind legs on signal from the trainer (whip tapping). The first test was performed in the home environment and lasted 3 days; 7 minutes/horse/day. One month later, the same training stages were applied to the horses in a novel, outdoor environment. Performance, measured as final stage in the training programme, and HR were recorded. As expected, HR was significantly higher in the novel compared to the home environment (e.g. mean HR (bpm): One-way RM ANOVA; Home 53 $\pm$ 1.1 vs. Novel 65 $\pm$ 2.9; $F = 14.6$; $P < 0.001$) and performance was significantly lower (Final stage: Home: 3.1 $\pm$ 0.2 vs. Novel 2.2 $\pm$ 0.2; $F = 7.5$; $P = 0.012$). There was a significant, negative correlation between performance and HR in the novel environment ($r_S = -0.66$; $P < 0.001$), whereas there was no such correlation in the home environment. Performance and HR did not correlate in the two environments. FCM levels were low (1st collection: 4.1 $\pm$ 0.5 and 2nd collection: 4.4 $\pm$ 0.7 ng/g) and did not correlate with performance nor HR in the learning tests. The experiments are part of a larger study, investigating the link between fearfulness, learning, basal stress levels and social rank in horses. Riders and trainers should be aware that stressed horses are likely to have a reduced learning capacity. Horses that perform well in the home environment may not necessarily perform at the same level under stressful conditions due to interference by external stimuli. Horses' heart rate in stressful conditions can be used to predict performance.

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The impact of maternal equine appeasing pheromone on cardiac parameters during a cognitive test in saddle horses after transport

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Stress is known to affect cognitive processes in most species. Transport is one of the most common stressing events in horses and impairs their performances. The purpose of this study is to assess the impact of a semiochemical, released by lactating mares, EAP (Equine Maternal Pheromone), to control this stress and maintain cognitive capabilities during a standardized test. 23 horses from different breeds, between 2 and 20 years old, were divided in two homogeneous groups; by sex, age and transport experience; horses were included in a double blinded, randomized, two parallel groups study (EAP vs placebo). The treatment was applied 20 minutes before each transport. Every horse was transported on a standardized 60-km roundtrip. The cognitive assessment was divided into three sessions: learning and memorization (during these sessions, horses were trained to differentiate two geometric figures: a yellow circle and a blue triangle, to get carrots) before transport and reversal (if horses learned to receive carrots in the yellow circle, in the reversal session they obtained the reward only if they touched the blue triangle) after transport. Emotional variations were evaluated thanks to cardiac parameters during the reversal session: cardiac parameters were measured through Heart Rate Variability (HRV). The placebo and EAP groups were compared using the two-sample Student t test. We found significant differences between the two groups with regard to Heart Rate: (EAP: 56.36 $\pm$ 7.63 bpm; placebo: 64.48 $\pm$ 9.37 bpm; $t_{21} = 2.27$; $P = 0.03$). We found no significant differences between the two groups for the mean square root for differences in successive RR intervals (RMSSD) (RMSSD: EAP: 66.71 $\pm$ 32.66 ms; placebo: 55.42 $\pm$ 46.82 ms; $t_{21} = -0.66$; $P = 0.51$) and also for Low Frequency/High Frequency even if the ratio is higher in the placebo group (LF/HF: EAP: 6.21 $\pm$ 8.48%; placebo: 7.18 $\pm$ 8.81%; $t_{21} = 0.27$; $P = 0.79$). Results show the impact of EAP on cardiac parameters during a cognitive test after a stressful situation (transport). The present study highlights the interest in using and investigating the semiochemical approach to facilitate horses' adaptation process during a cognitive effort. It is interesting to assess physiological changes in horses during a standardized test such as this one: it is crucial to consider this change during cognitive processes in order to manage and to better understand the emotional state of an animal.

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Effects of breaking, starting and training sessions on adrenocortical responses of Arab horses

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Breaking and starting represent critical phases of human-horse interaction. Aim of this study was to evaluate whether breaking, starting and training sessions had different effects on post-exercise circulating cortisol changes of eight healthy Arab horses (3 males, 5 females), 1-3 years old. Group I: (2 males, 2 female horses) submitted during two consecutive weeks on alternate days to breaking sessions, represented by 60 min exercise performed with rope on a round track (10 min walk, 10 min trot in a clockwise direction; 10 min walk, 10 min trot in an anti-clockwise direction; 10 min walk, 10 min trot in a clockwise direction).

After a week, they were submitted during two consecutive weeks on alternate days to starting sessions, represented by 60 min exercise performed with rope and thorax belt, as described before. Group II: (1 male, 3 female saddled horses) submitted during two consecutive weeks to daily training sessions, represented by 60 min exercise performed with the same rider on a round track (10 min