How does social reshuffling influence lying behaviour in donkeys?

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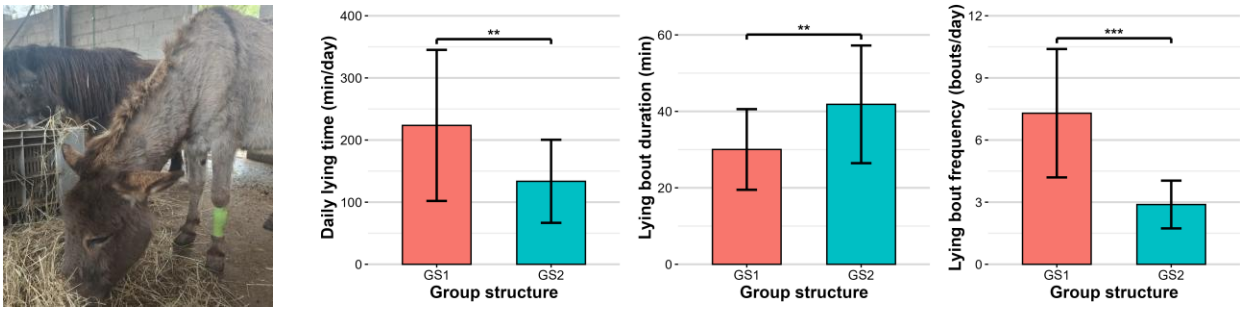
Lying behaviour is a key component of animal welfare; however, quantitative information on its modulation by social organisation in donkeys remains scarce, despite the species' pronounced social nature [1]. This study investigated lying behaviour in domestic donkeys and assessed the influence of group structure, age, sex, and social affiliation across two observation periods characterised by regrouping (GS1 and GS2). Accelerometer data (Hobo Pendant) at 0.40 Hz were collected from 11 donkeys for two 4-day monitoring sessions, each providing continuous 24-hour recordings, from which daily lying time, lying bout duration, and lying bout frequency were extracted. At GS1, donkeys were housed in two stable social groups, whereas at GS2 all individuals were merged into a single group following social reshuffling. Effects of group structure, age, and sex were analysed using linear mixed models with donkey identity as a repeated factor. Daily lying time decreased from GS1 to GS2 following social reshuffling, from 223.6 ± 121.6 to 133.6 ± 66.9 min/day (p = 0.003), while lying bout duration increased from 30.0 ± 10.6 to 41.8 ± 15.4 min (p = 0.007) and lying bout frequency decreased from 7.3 ± 3.1 to 2.9 ± 1.2 bouts/day (p < 0.001). Age was significantly associated with daily lying time (p = 0.023) and lying bout frequency (p = 0.006), whereas sex had no detectable effect (p > 0.05). Lying synchrony was analysed at the dyadic level using linear mixed models with dyad as a random factor. Overall synchrony between all donkey pairs decreased from GS1 to GS2 (6.4% vs. 3.3%), in parallel with the reduction in mean lying time (15.97% vs. 9.60%). When considering socially affiliated dyads, synchrony was significantly higher under GS1 compared to GS2 (7.98% vs. 3.72%; p = 0.005). These findings indicate that lying behaviour in donkeys is sensitive to changes in social organisation and age, and that social reshuffling may disrupt coordinated lying among established affiliative partners, providing a foundation for future studies using larger populations and time-resolved behavioural measures.



a **b** **c** **d**

Figure 1: a) Accelerometer positioned on the left forelimb for continuous activity monitoring; b) Daily lying time (min/day); c) Lying bout duration (min); d) Lying bout frequency (bouts/day)

[1] De Santis, Marta, Samanta Seganfreddo, Morgana Galardi, Franco Mutinelli, Simona Normando, and Laura Contalbrigo. "Donkey behaviour and cognition: a literature review." *Applied Animal Behaviour Science* 244 (2021): 105485.

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