

Effects of Immunocontraception on Relationships of Female Feral Horses (*Equus caballus*)

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Abstract

Immunocontraception treatment has been shown to affect behavior in feral horses; treated females change groups more often, which can disrupt the dominance hierarchy in previously well-established groups. My goal was to determine dominance relationships between treated vs. non-treated females. Evidence suggests that treated females are more likely to initiate aggressive acts than non-treated females.



Introduction

- Survivors of Spanish shipwrecks, feral horses have been on the Outer Banks of North Carolina for 400-500 years
- Genetic analysis shows that they are of Spanish descent
- The Shackleford Banks population is managed by the National Park Service
- A proportion of females in this population has been contracepted with porcine zona pellucida (PZP), to keep the population between 100-120 individuals
- Previous work has shown that treated females are more likely to change groups (1)
- My goal was to characterize dominance relationships between treated vs. non-treated females



Methods

- Collected field data from June 16, 2016 – July 22, 2016
- Examined two classes of females:
 - Treated: n=14
 - Untreated: n= 46
- Behavioral observations were conducted via scan sampling for 30 minute blocks (2)
- Mare aggression was recorded *ad libitum* during scan sampling (2)
 - Calculated the total aggressive acts initiated by mares
 - Determined mare dominance hierarchies within bands
- Statistics were run in R, version 3.30

Results

- Treated mares initiated aggression more often than did untreated mares (General Linear Model: estimate = 2.71, SE = 0.91 t=2.98, P = 0.04, see Figure 1).



Figure 1. Treated mares initiated aggression more often than did untreated mares ($P = 0.04$).

- Treatment status did not affect the proportion of fights won by mares (General Linear Model: estimate = 1.45, SE = 1.37 t=1.06, P = 0.30, see Figure 2).

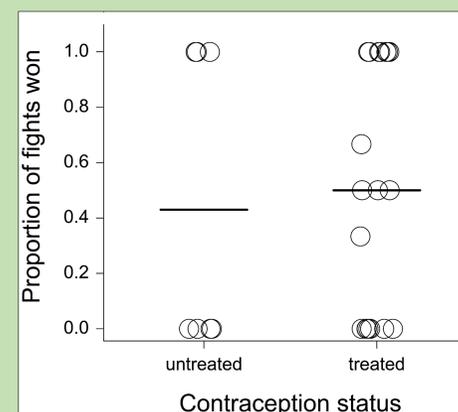


Figure 2. Treatment status did not affect the proportion of fights won by mares ($P = 0.30$).

Conclusion

- Mares treated with PZP were more likely to initiate aggression than were untreated mares
 - This behavior could have a dramatic impact on the relationships among females**
 - Increased stress could affect the entire population, due to the disturbance of well-established social groups**
- Treatment status did not impact the amount of fights won by mares
 - This indicates that PZP contraception did not influence the dominance hierarchy among female horses**
- Taken together, these results indicate that although treated mares initiate more aggressive interactions than do untreated mares, this increased aggression does not translate into higher overall social rank of treated mares
- Further studies could be done to increase the observation pool, and to investigate the relationship between treated vs. non-treated mares and their social rank more fully

Impact of SWP

- Created opportunity to analyze my collected data and hypothesis
- Learned how goal setting and reflection can improve quality of work
- Developed organization and planning skills
- Provided insight into professional research career
- Practiced communication with peers and mentors

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References

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- Altmann, 1974, *Behaviour*, 49: 227-66

