Influence of Age and Food Anticipation on Stress Behavior in Stabled Horses

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Introduction

Figure 1: Stabled horse.

- Anticipatory behavior related to positive rewards (e.g., feeding) occurs in many species (Bassett & Buchanan-Smith, 2007).
- Horses tend to display specific stress behaviors as well as a general increase in activity during anticipation. Common behaviors include vocalizations, pawing, or pacing (Peters et al., 2012).
- Older horses generally display fewer or more muted stress responses compared to younger horses that are prone to reactivity (Abdel-Azeem & Ameash, 2021).
- This study aims to find the relationship between age and food-related stress behavior.

Hypotheses & Predictions

Horses will exhibit more stress behaviors prior to mealtime, and younger horses will exhibit more stress behaviors than older horses. Horses will exhibit non-stress related behaviors more often after mealtime.

- P1: The frequency of stress behaviors (e.g., looking to door, pinned ears, pawing, pacing, head tossing, tail swishing, weaving, and vocalizing) will be higher before mealtime
- P2: The frequency of non-stress behaviors (e.g., foraging) will be higher after mealtime.
- P3: Younger horses will perform stress behaviors (e.g., looking to door, pinned ears, pawing, pacing, head tossing, tail swishing, weaving, and vocalizing) at a higher frequency than older horses.

References

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Methods

Figure 2. Horse pinning ears (left) and horse foraging from hay net (right).

- Stabled horses (Fig.1; n=6 females, n=12 males) were observed over two months.
- Individual age ranged from 3-34 years old.
- Individuals were video recorded for 10 minutes before and after their 3:00pm meal on three different days.
- I recorded looking to door, pinned ears, pawing, pacing, head tossing, tail swishing, weaving, vocalizations, and foraging every 30 seconds from video recordings (Fig. 2).
- We used general linear models to test for effects of age and time on frequency of these behaviors. We also tested for the random effect of individual horse and the date.

Results

Effects of Feeding

- Horses looked to door (z=-6.760, p<0.01), pinned ears (z=-6.674, p<0.01), and tossed head (z=-2.456, p=0.014) significantly more before mealtime (Fig. 3).
- Horses foraged significantly more after mealtime (z=5.404, p<0.01).
- There was no significant difference in frequency before and after mealtime for tail swishing (z=01.472, p=0.141), weaving (z=-1.230, p=0.219), or vocalizations (z=-1.397, p=0.163).

Effects of Age

- Younger horses looked to door (z=-3.372, p=0.001), pinned ears (z=-2.940, p=0.003), and tossed head (z=-2.752, p=0.006) significantly more than older horses (Fig. 4).
- There was no significant difference in frequency by age for tail swishing (z=-1.916, p=0.055), weaving (z=-0.108, p=0.914), vocalizations (z=-1.190, p=0.234), or foraging (z=0.629, p=0.529)
- Horses rarely performed pawing and pacing.

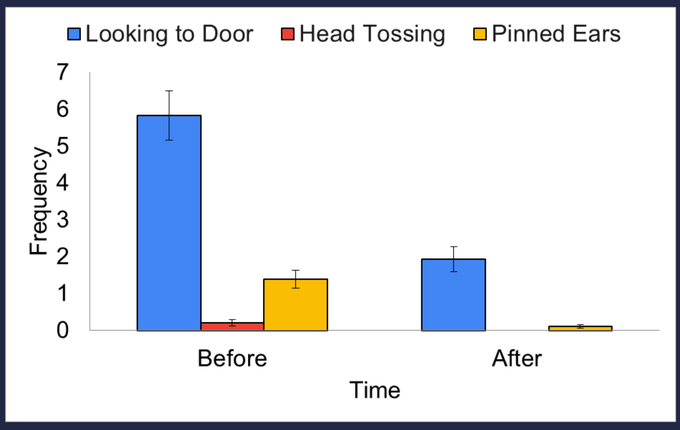

Figure 3. The frequency of looking to door, pinning ears, and head tossing before and after mealtime.

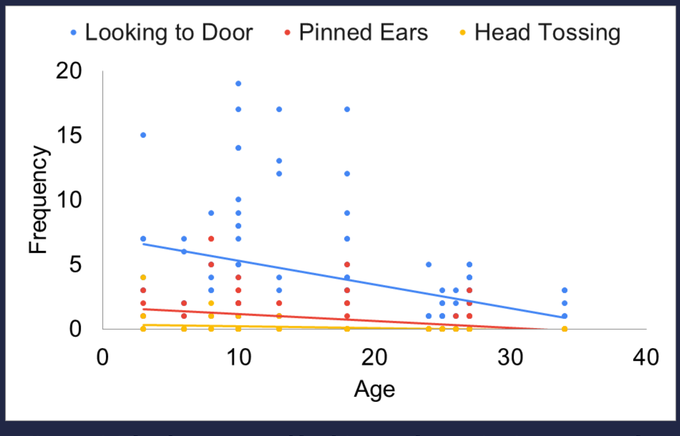

Figure 4. The frequency of looking to door, pinning ears, and head tossing versus age.

Discussion

- Horses consistently displayed more stress behaviors prior to mealtime, emphasizing the importance of consistent schedules to reduce stress.
- Younger horses had a higher stress response than older horses, which could provide insight into other age-related differences.
- This may indicate that older horses may be better skilled at emotional regulation (Aurich et al., 2015).
- The difference in stress by age may reflect that older horses grow habituated to routine, or that there is a variation in temperament.

Future Directions

- Investigation into how stress behaviors change as a single individual ages could clarify the role of aging vs. habituation.
- Further research could be done to examine other age-related differences in stress, such as during handling, groundwork or riding.

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