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## Foal and Mare Behavior Changes during Repeated Human-Animal Interactions in the First Two Weeks after Foaling

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### ABSTRACT

This study is important to the equine research field to demonstrate if handling neonatal foals and mares who recently foaled is invasive and may change how the foals and mares will behave around humans. The data show the effects of repeated blood draws and frequent handling on the foals and mares. The behavior of the foals and mares were documented over two weeks post foaling to determine if a behavior change has occurred due the handling. Results show no significant statistical difference in the behavior of the foals or mares throughout the study. Frequent handling of foals and mares for a research project in the period after foaling did not seem to be detrimental to their behavior.

## INTRODUCTION

To not interfere with neonate foals bonding with their mares, horse managers and veterinarians are recommended to only moderately handle foals (Diehl et al. 2002). The purpose of this study was to determine if frequent handling with repeated blood draws changes the behavior of the foal and mare. Evaluation of behavior during handling in the two weeks after gestation and its invasiveness was performed.

The hypothesis for this study was that the foals' behavior will be positively affected by the handling. After being initially handled the foals will become more accustomed to human interaction. This will make the behavior of the foal during subsequent handling more pleasant.

Horses' natural behavioral response to a stimulus is either to fight or flight, which may injure humans nearby. To dissuade this response, handling and training can calm the horses (Søndergaard & Jago 2010). Handling includes a variety of activities including touching or leading a horse. For this study, handling includes taking blood samples from the foal from the jugular vein. In order to obtain the blood sample, the foal needs to be restrained. The handling for the mare includes using a halter and lead rope.

Through domestication horses have obtained behaviors that are beneficial for the human. However, horses may respond to situations in different ways. Some horses may become

aggressive when held down while others may become calm. Behavior can be defined as the animal's response to its environment (Piccione & Giannetto 2010).

## LITERATURE REVIEW

A study by Collette et al. (2000) shows that handling at a young age reduces stress responses in a number of birds and mammals. Early handling is beneficial for these animals and may be beneficial for horses. In a study by Henry et al. (2005), the difference in behavior between a control group (no interaction) and a treatment group (fed by hand and brushed) was investigated. After 13 months, they tested how close each foal would move to the experimenter. The more handled group came closer to the experimenter and initiated more physical contact than the control group. Through this study it was found that the more handling the foals received the calmer the foals were around people. In the present study, changes in behavior of foals and mares during handling for the purpose of drawing multiple blood samples on the foals was investigated.

## MATERIALS AND METHODS

Twenty horses (ten foals and ten mares) were observed between January and June of 2014. Each foal and mare was observed for a two-week period. The mares were first transported to the University of Illinois Horse Research Farm before foaling. Day one was defined as the foaling date. Blood draws were performed on day three, seven and fourteen as part of a concomitant research project. Different operators restrained mare and foals and the behavior of the foal and mare were observed during this time. A veterinarian drew blood samples, monitored heart and respiratory rates and took the temperatures of the foals. The

duration of this procedure could be from five to twenty minutes depending on the cooperation level of the foal. The behavior was quantified using the behavior scale (1-4 points) shown in **Table 1**. The same procedure was repeated on day three, seven and fourteen after the mare gives birth to the foal. All foals and mares received the same treatments. After all of the data were collected, they were analyzed for correlations between day three and day fourteen behavior scores. Trends were examined to determine whether the handling was detrimental, beneficial or insignificant to the horses.

**Table 1.** Mare and foal behavior scoring

| Score | Mare Behavior                                      | Foal Behavior                                 |
|-------|--|---|
| 1     | Ears forward, calm, attentive                      | Down, quiet or easy to catch and place needle |
| 2     | Mildly nervous or concerned, 1-2 snorts            | Easy to catch, but jumpy at needle placement  |
| 3     | Walked away from handler or showed mild aggression | Feisty, running away                          |
| 4     | Ran away or very aggressive/attacking              | Very difficult to catch or panicky            |

## RESULTS AND DISCUSSION

### Foals

Of the ten foals, five had the same behavior on day three and day fourteen and two foals' behavior improved by one number score. Three foals had worsened their behavior, one by one number score, one by two number scores, and one by three number scores (**Figures 1 & 2**).

The Wilcoxon signed-rank test was used to obtain the p value.

### **Mares**

Of the ten mares, six had the same behavior on day three and day fourteen and two mares' behavior improved by one number score. Two mares had worsened their behavior, one by one number score and the other by two number scores (**Figures 1 & 2**).

### **Total**

For all of the mares and foals, four horses improved their behavior by one number score. Eleven horses kept their behavior the same. Two horses worsened their behavior by one. Two horses degraded their behavior by two. One horse degraded their behavior by three (**Figures 1 & 2**). The behavior overall did not change over time and therefore the handling did not influence behavior.

In this study, some variables may have affected behavior scores such as difference in weather on days of sampling, using maiden mares vs. pluriparous, horse breed, the experience of the handlers, the health of the horse, and the state of alertness of the horse (awake vs. sleeping). Also, the scores may have been affected by the bias of the observer because different observers recorded the scores.

Throughout this study, we noticed mares became accustomed to the researchers handling their foals. There was correlation between the behavior of the first day and the last day of handling in mares. Foals became more active from day one to day three as we would expect as a normal behavior of being more responsive one or two days post foaling (Nauwelaerts et al. 2013). Comparisons between behavior scores were started at day three to exclude the bias induced by first days of life change in behavior. Many

variables could have influenced the mare and foals' behavior such as other external handling from caretakers on the farm, interaction with other foals or weather changes. Moreover, all the foals used were healthy, so to remove any differences in behavior caused by illness. The behavior scale was created to account for more objective interpretation by the different observers used in the study.

## **CONCLUSIONS**

There was no statistical difference between day 3 and day 14 ( $p>0.05$ ) (**Table 2**). Therefore, frequent handling of foals and mares for a research project in the period after foaling did not improve behavior. The behavior did not change over time so handling did not influence behavior. Veterinarians and clinical workers do not need to worry about changing the foals' or mares' behavior when working with them in the clinic if they are properly handled.

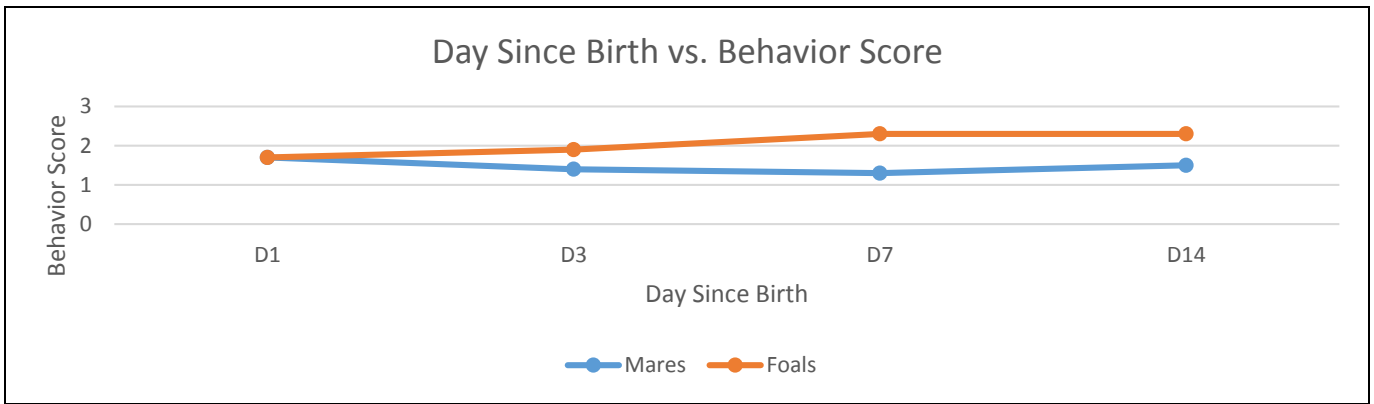
### **Future Research**

To gain more knowledge on this subject, a research experiment can be implemented with a control group (not handled). Extending the duration of the observation period up to two or three months after foaling and during breaking of the foals may provide extra interesting data of use by horse owners and equine researchers.

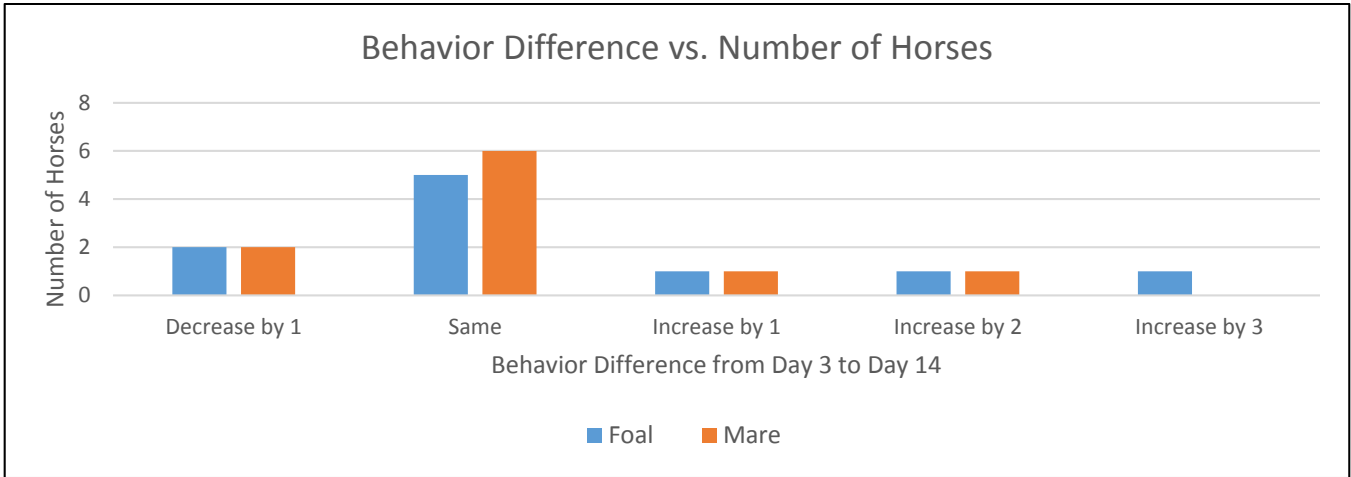
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**Figure 1.** Mare and foal’s average behavior scores over two weeks



**Figure 2.** Behavior differences from day three to day fourteen



**Table 2.** Mare and foal behavior average scores and P values

|       | Day 1 | Day 3 | Day 7 | Day 14 | P value |
|-------|-------|-------|-------|--------|---------|
| Mares | 1.7   | 1.4   | 1.3   | 1.5    | 0.73    |
| Foals | 1.7   | 1.9   | 2.3   | 2.3    | 0.34    |
| All   | 1.7   | 1.7   | 1.8   | 1.9    |         |

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