# The Effects of Oxytocin and Pheromones on First Time Breeding Hamsters Sarah Ravert and Shaeleigh Mount Dr. Robin Shedlauskas

#### Abstract

Female hamsters, specifically first time breeders, are typically known as being spontaneously infacidal or harmful to their young in the direct moments after parturition occurs. A lot of facilities tend to use hamsters as research animals, but have problems with obtaining an appropriate amount of young because of infancidal mothers. By conducting this research project, there is a possibility that a simple, cost effective, and low labor solution could fix this issue.

## Methodology

Materials used:

Four females hamsters Two male hamsters for breeding Oxytocin nasal spray Pheromone collars

Oxytocin nasal spray was sprayed onto a cotton

#### Discussion

While trying to breed every hamster, vaginal cytology was taken to get a look at where in the estrus cycle they currently were. While all females seemed to look like they were in estrus at a specific time, none of them seemed to be receptive to a male. They did not try to attack or mount the male but instead were not interested at all. This was after oxytocin and pheromones, if any, had been implemented into their habitats. From this observation, it is safe to conclude that implementing oxytocin and/or pheromones into a hamster's habitat will not make them more receptive to a male. When litters were found, initial litter counts were taken, Mothers did not seem stressed, and all young were seemingly thriving at the time of counting. During the days, technicians from the lab would write down if they saw any stressful behaviors. Litters were checked and counted every day until weaning, careful not to touch the pups directly as this could result in unknown scents to the mothers, which could result in stress. When a decreased litter number was found, it was assumed that the mother cannibalized the pup. This could have been due to the pup not thriving, and dying naturally. HO3A, with both oxytocin and pheromones, ultimately no litter was found. This hamster seemed to be temperamental throughout the experiment process. Although this hamster did gain weight throughout the pregnancy time period, there was ultimately no litter found. It is possible that the mother cannibalized the whole litter directly after birth, but there was no blood, or any remnants suggesting this scenario. It is possible that this hamster experienced pseudopregnancy. This would explain the weight gain and nesting behavior, but resulted in no litter being born.

#### Introduction

Female rodents are commonly known to be cannibalistic and infanticidal to their own young, especially when giving birth to their first litters. While this can be due to temperament of the individual animal, it can also be due to stressors in their environment, like small or inadequate habitats.

Oxytocin, commonly known as the cuddle hormone, can be used to boost the mothering abilities in multiple species, and make animals more interested in caring for their young. ball until drenched, and the smell was potent. Pheromone collars were cut into smaller sizes. These were then placed into tea balls, so that the hamsters could not get to the oxytocin or collar pieces, but could still smell them and they could diffuse around the habitat. These materials were replaced when they no longer released a potent scent into the habitat.

Vaginal cytology was completed to see what stage of the estrus cycle the female was in. This will help prevent fighting between a male and female if attempted breeding was conducted while a female was not in estrus. If a female was not in estrus at a given period, cytology was taken a few days later to see when she would next be in estrus. During pregnancy, females were weighed every three days to see if there was any significant weight gain. If there was weight gain of a few grams, it was noted that there would most likely be a viable pregnancy.

Once pups were born, mothers and litters were

Pheromones, are commonly used for animals that are often in stressful situations and are used to help them stay calm and relaxed. By mixing both pheromones and oxytocin, we may be able to see an increase in infant survivability, less pre-weaning death due to a decrease in infanticidal and cannibalistic tendencies.

#### References

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monitored for behavior. Pups were counted every day, and any deaths were recorded. Oxytocin/pheromones, if any, were still in the habitats at this time.

Results

HO3A(pheromones and oxytocin)- bred 10/19, ultimately no litter found HO3B(Control)- -bred 10/19, birthed 10 pups 11/4, 10 surviving pups 11/21 HO4A( pheromones)-bred 10/19, birthed 16 pups 11/4, 15 surviving pups 11/21 HO4B(oxytocin)- Birthed 19 pups on 10/12, 15 surviving pups 11/21

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### Conclusion

Ultimately, the results of this project are inconclusive. More data would need to be collected and more trials would need to be conducted to obtain a clearer answer on if Oxytocin and Pheromones make a significant decrease in the rate of infanticidal mothers.

While we did not see an overabundance, if any, infanticidal tendencies from these specific hamster mothers, this could have been due to the temperament of the hamsters. All females used in this specific project were tame, and docile, and did not mind being handled. Other hamsters with different temperaments might have had a larger tendency to cannibalize their young. There were also some errors that would need to be fixed and implemented before conclusions could be accurate. For example, cameras could be implemented so that hamsters could be monitored while giving birth. This could give exact information on how many pups were actually born, if mothers were exuding stressful behavior, or if mothers cannibalized any amount of their young right away.