

Methods in Applied Ethology: Determining baseline activity of pigs in individually housed laboratory environment

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Introduction

- The objective of this undergraduate research was to become familiarized with methods and technology used in applied ethology. Applied ethology researches practical issues for the care of domestic animals (Price, 2008).
- The focus in my undergraduate research was to observe oral-nasal-facial (ONF) behavior of 6-month-old Yucatan minipig boars in a biomedical environment, with 12-hour light and 12-hour dark artificial lighting.

Table 7. Effect of feeding frequency on the percentage of time spent conducting each behavior (percentage of time in a 24-h period) for gestating sows^{1,2}

Behavior	Frequency of feeding per day		SE	P-value
	2	6		
Agonistic	0.02	0.02	0.01	0.99
Active	4.43	5.13	0.25	0.07
Oral-nasal-facial	2.53	2.63	0.17	0.65
Lie	95.58	94.88	0.25	0.07
Stand	1.05	1.51	0.09	0.02
Sit	0.55	0.57	0.09	0.84
Drink	0.06	0.07	0.01	0.49
Feed	0.23	0.36	0.03	0.02

¹Behavior observations were recorded for 4 consecutive days in each treatment.
²Active behavior was determined by subtracting lying behavior from the sum of all behaviors.

Figure 1. ONF used as an observed behavior to study effects of different feeding frequency on the percentage of time spent in each behavior. ONF at two feeding times was 2.53% and six feeding times at 2.63% (Schneider, 2014).

- Our results have higher ONF percentage than other observed behavior and could be contributed to the breed, size, sex, and/or environment of the Yucatan minipigs. We needed to build a baseline behavior for the minipigs in the laboratory setting. Baseline information can help us compare observed behaviors before and after experimental treatments.
- Locomotor stereotypy behaviors are commonly observed in captive animals and are most likely to develop when animals are prevented from exhibiting maintenance behaviors, such as feeding, lying, or performing non-nutritive oral behaviors (NNOB). In pigs, ONF behaviors (Figure 2) are considered NNOB. In pigs, ONF follow a circadian rhythm (Price, 2008).



Figure 2. ONF is defined with rubbing, sniffing, licking, biting, and touching the mouth, snout, or face to an external object; ONF is a nonfeeding behavior in that no feed was present when ONF was recorded (Hulbert, 2006).

Hypothesis

- ONF circadian rhythm can serve as a baseline behavior for pigs in an individually housed laboratory environment.

Objective

- Observe nine pigs during the artificial light period of 7am to 7pm
- Identify and log behaviors with Observer XT 11.5
- Gather ONF durations for 2 hour time frames and configure percentage of time spent in ONF from the total logged time
- Graph ONF percentages and record trend/s

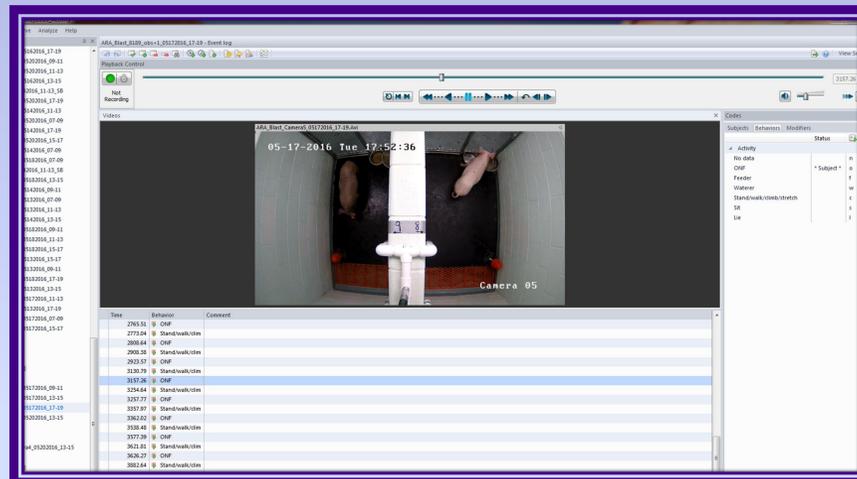


Figure 3. Pig on the left displaying ONF behavior on Observer XT 11.5.

Materials and Methods

- Pigs were housed individually at a Industry's biomedical site
 - 190 cm x 112 cm pen
 - Fed pellet feed twice a day : 7-9 am and 1-3 pm
 - Provided a toy
 - Ad libitum water
- Observed by IP cameras mounted 2 m high from the floor
- Footage recorded onto a DVR surveillance system
- Observed 84 videos with 168 hours of footage with two other trained students
- Logged behaviors:
 - Feeder, lie, ONF, stand/walk/climb, sit, waterer, and no data
- Collected data from nine pigs but only data from six pigs are presented

Results

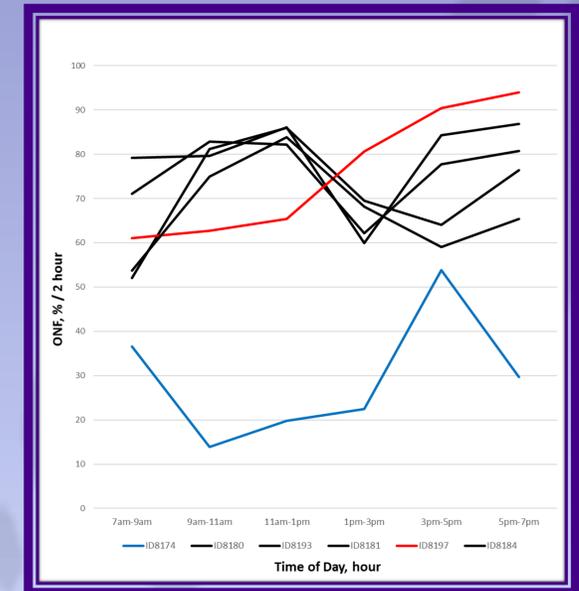


Figure 4. Chart of how much time the pig spent doing ONF behavior during the observed period.

- ONF behavior was higher than 50% during total observation
- There was less ONF around feeding time = Averaged 65%
 - 7-9am SD 65±16, 1-3pm SD 65±20
- There was more ONF after feeding times = Averaged 78%
 - 9-11am SD 78 ±27, 11am-1pm SD 78±26, 3-5pm SD 78±15, 5-7pm SD 78±15
- Pig ID8174 was abnormal due to pacing (data in full time budget, not shown)
 - ONF behavior fluctuated and did not follow the other pig's pattern
- Pig ID8197 was abnormal due increased lying position from 7am to 1pm, and out of camera's view making it difficult to conclude ONF behavior.

Conclusion

- For 4 pigs, ONF behavior demonstrated a circadian rhythm following feeding and the 12-hour light period.
- Two pigs were not in similar circadian patterns to the others. One pig paced with no ONF, which may be an abnormal behavior. Another pig spent more time in lying position and out of camera's view.
- Observations of the flooring, these pigs had formed grooves from excessive pacing, therefore, they likely were stereotypies.

References

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