

# Proximity of Nursery Pigs from a Human Observer during an Animal-human Interaction Test Before and After Vaccination

## A.S. Leaflet R2812

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### Summary and Implications

The objective of this experiment was to determine distance between two anatomical measures in nursery aged pigs to a human observer before and after vaccinations in their home pen using a digital image. Three treatments were compared TRT One: Saline (*Saline*; n =50), TRT Two: Ingelvac<sup>®</sup> CircoFLEX-MycoFLEX<sup>®</sup> (Boehringer-Ingelheim Vetmedica, Inc., St. Joseph, MO; *MCFLEX*; n = 48) and TRT Three: Circumvent<sup>®</sup> PCV-M (Merck Animal Health, Summit, NJ; *Circumvent*; n =51). Snout and tail anatomical locations within “touch”, “look” and “not” were determined. Data were analyzed using the PROC MIXED procedure of SAS. There were no ( $P > 0.05$ ) injection treatment differences for snout or tail base proximities within the behavioral categories. There were no ( $P > 0.05$ ) differences comparing snout and tail base anatomical location proximities from the observer’s index finger within the “touch”, “look”, and “not” categories across pre- injection treatments. There were no post-injection treatment differences ( $P > 0.05$ ) for snout or tail base proximities from the human observer when evaluating pigs from the “touch” and “not” categories. However, tail base proximity for MCFLEX pigs was shorter ( $P < 0.008$ ) in the “look” category compared to Circumvent and saline. Snout proximity to the human observer’s index finger for pigs classified as “look” was greater ( $P < 0.05$ ) for Circumvent pigs compared to MCFLEX (Table 2). A total of 8.4% unobservable tail base and 37.9% unobservable snout locations were not visible pre-injection. Post-injection, 17.7% of tail base locations were unobservable compared to 46.4% of pig snouts.

Due to the large number of unobservable data values in measuring the proximity from the observer’s index finger to the pig’s snout and tail base anatomical locations, it is not recommended for use as a practical on-farm pig behavioral welfare assessment measure.

### Introduction

There is still not a universally agreed and accepted behavioral methodology that can be conducted on-farm to assess a pigs’ approachability to a human in their home pen. This can be attributed to numerous challenges, for example, the sensory perception of the pig, age, group size, and previous caretaker-pig interaction. There have been numerous tests used to determine the level of fear in a variety of farm species, for example the open field, and human and novel approach. Fangman et al. (2010) coined the term “willingness to approach” as a more positive alternative to “fear”, describing pigs approaching or looking at the human in their home pen. However, if pigs do not get categorized as approaching or looking then what other behaviors / postures are these pigs engaging in? The objective of this experiment was to determine distance between two anatomical measures in nursery aged pigs to a human observer before and after vaccinations in their home pen using a digital image.

### Materials and Methods

All procedures were approved by the Iowa State University IACUC committee.

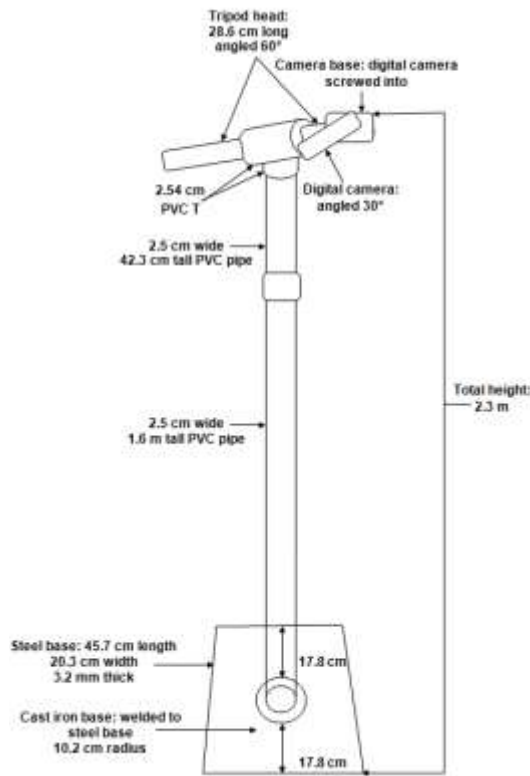
**Animals and location:** A total of 149 pens housing ~19 mixed sexed pigs/pen (0.3 m<sup>2</sup>/pig; 6-wk age) within four rooms, over 2 barns were used in this trial. The experiment was conducted over two consecutive days, November 2011 at a commercial nursery site located near Jefferson City, MO.

**Diets, housing and husbandry:** Nursery rooms were 34.1 m width x 18.3 m length and ceiling height was 2.1 m. Pens measured 1.8 m width x 3 m length with steel dividers between pens and one front steel gate at the front each nursery pen that measured 81.3 cm height.

**Treatments:** Three treatments were compared TRT One: Saline (*Saline*; n =50), TRT Two: Ingelvac<sup>®</sup> CircoFLEX-MycoFLEX<sup>®</sup> (*MCFLEX*; n = 48; Boehringer Ingelheim Vetmedica Inc. (St. Joseph, MO) and TRT Three: Circumvent<sup>®</sup> PCV-M (*Circumvent*; n =51; Merck Animal Health (Summit, NJ). The experimental unit was the pen of pigs. The authors were blind to injection treatments until the data had been collected and statistical models were confirmed as correct by a statistician.

**Nursery pen image capturing device:** The nursery pen image capturing device location was free-standing across the alleyway from each pen gate (Figure One).

**Figure 1. Schematic of the digital image capturing device**



**Injection methodology:** An entire pen of pigs received one of three injection treatments. All dosages were 2 mL/IM (Table 1).

**Table 1. Vaccination schedule.**

Treatment	Vaccination Arrival	Vaccination 2 wk post arrival
Saline	CircoFLEX-MycoFLEX	Saline
MCFLEX	Saline	CircoFLEX/MycoFLEX
Circumvent	Circumvent PCV-M	Circumvent PCV-M

**Animal-human interaction methodology:** The observer and the digital image photographer walked down the length of the nursery room to the farthest pen on the right side of the alleyway. The observer quietly set the nursery pen image capturing device at the midpoint at the front gate of the adjacent pen and quietly stepped over and entered the nursery pen. In conjunction, the photographer quietly sat on a bucket behind the observer and leaned back on the front pen gate. At the conclusion of the 15-s period, the observer signaled to the photographer, by leaning back against the front gate, for the photographer to capture a digital image using a wireless remote.

**Measures**

**Behavior and snout and tail base proximity:** Data were collected 24-h prior to injection to establish pre-injection baseline values and a second time 6-h after injection to establish post-injection values. Behavior was classified into one of three categories (1) “Touch” was defined as any part of the pigs’ body touching the human observer (2) “Look” was defined as eye contact (both eyes) with the observer and (3) “Not” was defined as pigs not previously classified as approach or look using the digital image. The proximity (cm) from the observer’s index finger to each pig’s snout and tail base was measured using the digital image. There was a possibility to collect 2863 total snout and tail base anatomical data values. The proximities from the observer’s index finger to the pigs’ snout and tail base were measured using the ruler tool in Adobe Photoshop CS5. The ruler tool was calibrated using a length ratio (6.9) for the nursery feeder (90.4 cm) pixel length of the feeder (620 pixels) from a digital image (620 pixels/90.4 cm). If a pig’s snout or tail base was not clearly visible in the digital image, the proximity was recorded as an unobservable value in the data set.

**Statistical Analysis:** Data was analyzed using the PROC MIXED procedure of SAS. Fixed effects for room and injection treatment were included in the model. The proximity from the pig to the observer within each behavior category across injection treatments was included as a random effect in the model. A  $P \leq 0.05$  value was considered to be significant. Lost anatomical points will be presented descriptively.

**Results and Discussion**

There were no ( $P > 0.05$ ) differences comparing snout and tail base anatomical location proximities from the observer’s index finger within the “touch”, “look”, and “not” categories across pre- injection treatments. There were no post-injection treatment differences ( $P > 0.05$ ) for snout or tail base proximities from the human observer when evaluating pigs from the “touch” and “not” categories. However, tail base proximity for MCFLEX pigs was shorter ( $P = 0.008$ ) in the “look” category compared to Circumvent and saline. Snout proximity to the human observer’s index finger for pigs classified as “look” was greater ( $P < 0.05$ ) for Circumvent pigs compared to MCFLEX (Table 2). A total of 8.4% unobservable tail base and 37.9% unobservable snout locations were not visible pre-injection. Post-injection, 17.7% of tail base locations were unobservable compared to 46.4% of pig snouts (Table 3). Due to the large number of unobservable data values in measuring the proximity from the observer’s index finger to the pig’s snout and tail base anatomical locations, it is not recommended for use as a practical on-farm pig behavioral welfare assessment measure.

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## Acknowledgements

Boehringer Ingelheim Vetmedica Inc. for funding.

**Table 2. Nursery pig snout and tail base proximities from the human observer's index finger within the behavioral categories ("touch", "look", and "not") using digital image evaluation housed commercially.**

	Injection Treatment			<i>P</i> values
	MCFLEX	Circumvent	Saline	
<b>No. pens</b>	<b>48</b>	<b>51</b>	<b>50</b>	
<b>Pre-injection, cm</b>				
<b>Touch</b>				
Snout	14.2 ± 2.5	14.3 ± 2.4	15.6 ± 2.3	0.88
Tail base	74.2 ± 2.2	73.9 ± 2.0	76.8 ± 2.2	0.57
<b>Look</b>				
Snout	85.8 ± 2.3	86.9 ± 2.3	83.9 ± 2.3	0.63
Tail base	116.4 ± 2.0	115.8 ± 2.0	114.5 ± 2.0	0.80
<b>Not</b>				
Snout	119.8 ± 2.3	113.1 ± 2.4	116.4 ± 2.2	0.13
Tail base	127.5 ± 1.5	125.7 ± 1.5	128.5 ± 1.4	0.37
<b>Post-injection, cm</b>				
<b>Touch</b>				
Snout	28.8 ± 4.6	23.6 ± 6.4	18.2 ± 4.5	0.26
Tail base	70.5 ± 2.4	75.7 ± 3.4	72.3 ± 2.1	0.44
<b>Look</b>				
Snout	83.8 ± 2.3 <sup>a</sup>	91.8 ± 2.2 <sup>b</sup>	87.7 ± 2.1 <sup>ab</sup>	0.05
Tail base	110.9 ± 2.3 <sup>a</sup>	121.1 ± 2.4 <sup>b</sup>	118.4 ± 2.2 <sup>b</sup>	0.008
<b>Not</b>				
Snout	121.5 ± 2.1	124.3 ± 2.0	124.8 ± 2.2	0.49
Tail base	128.7 ± 1.3	127.0 ± 1.4	131.6 ± 1.4	0.06

**Table 3. Lost anatomical points for snout and tail pre- and post-injection.**

	Behavioral category, %		
	Touch	Look	Not
<b>Pre-injection</b>			
Snout	52.6	13.6	47.5
Tail	2.3	6.8	16.1
<b>Post-injection</b>			
Snout	73.2	11.4	54.6
Tail	3.9	24.8	24.4