Gilt and Barrow Approachability Behavior to a Human Observer

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Summary and Implications

The objective of this experiment was to determine if nursery pig sex affected how many pigs touched and orientated to the human or were classified as not-orientated during a human-animal interaction test using a live human observation and a digital image collection methodology. A complete randomized experimental design was utilized in this study where the pen of pigs was the experimental unit. Two methods, a human observer and a digital image, were assigned within rooms to all pens. Two treatments were compared, TRT One; barrows (n = 14 pens) and TRT two; gilts (n = 13 pens). There was a trend towards more gilt's approaching the human observer when using the live method (Table 1). However there were no ($P > 0.05$) differences for approachability between sexes when the digital image method was used (Table 2). In conclusion, for this age of pig there was no observed difference between gilts and barrows for touch, orientated and not categories when a human was in their home pen.

Introduction

Numerous human-animal tests in a variety of farm species have been used to try and determine fear levels. Such tests include the open field, human and novel approach-tests. Fangman and others (2010) coined the term "*willingness to approach*" (WTA) as a more positive alternative to fear. This WTA method allocated nursery pigs as either touching or orientating to the human in their home pen. A third category "not-orientated" included nursery pigs not meeting the previous criteria. The WTA method was conducted in real time by the human in the pen. In addition, how an animal reacts to a human can be vastly dependent upon the animals' age and sex, as well as previous caretaker-pig interactions. Therefore, the objective of this experiment was to determine if nursery pig sex affected how many pigs touched and orientated to the human or were classified as not-orientated during a human-animal interaction test using a live human observation and a digital image collection methodology.

Materials and Methods

Animal care and husbandry protocols for this experiment approved by the ISU-IACUC committee.

Location: The study was conducted November 4, 2010, at the Lauren Christian Swine Research Center at the Iowa State University Bilsland Memorial Farm, near Madrid, Iowa.

Animals: Purebred Duroc and Yorkshire crossbred barrows and gilts, body weight (BW) ranging from 24.4 kg to 31.9 kg, respectively. Pigs were not individually weighed before the study began. Average body weight was determined from previous performance records maintained on-site for nursery pigs of that age and genetic cross. All pens contained the same sex of nursery pig.

Housing and feeding: Each pen contained approximately 10 pigs per pen (0.32 m^2 per pig). Pens measured 1.5 m x 2.1m length, with steel dividers (81.3 cm height) between pens and one steel gate at the front of each pen (93.9 cm height.) A 4-hole dry feeder was located centrally at the front of the pen. Pigs were provided ad libitum access to a pelleted feed (1503 kcal/kg ME and 20.7% CP) formulated to meet or exceed requirements. Each pen contained one stainless steel nipple cup drinker 1.4 m from the front gate attached to the left or right pen divider, at a height of 33 cm above floor level. Metal tri-bar flooring was utilized in all pens. Caretakers observed all pigs at least once daily.

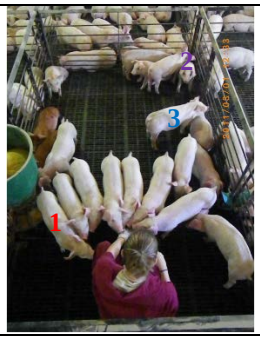
Experimental design: A complete randomized experimental design was utilized in this study where the pen of pigs was the experimental unit. Two methods, a human observer and a digital image, were assigned within rooms to all pens. Two treatments were compared, TRT One; barrows (n = 14 pens) and TRT two; gilts (n = 13 pens).

***Approachability methodology*:** The methodology followed that previously described by Weimer and others (2014). On approach assessment day, a human observer approached the nursery pen, positioned the image-capturing device at the front of the gate at the approximate midpoint, and quietly stepped into the pen immediately crouching down near the center of the gate. The evaluator extended and held still the left leather-gloved hand with the index finger extended, and began a stop watch, avoiding eye contact with the pigs for a 15-second period. The left hand and finger were extended to allow for the same anatomical location to be clearly visible in each digital image so that distance could be measured. At the end of the 15-second period, the observer looked behind her to ensure the sensor light on the digital camera had deployed and captured the digital image then looked back at the pigs and recoded the live-categorical counts for the touch, orientated and not

orientated categories. After counting all the nursery pigs, the observer rerated her steps and exited the nursery pen. The live observation numbers for pigs' engaged in each of the three categories were recorded on a scan sheet located in the central alleyway. The observer then proceeded until all pens in the room had been entered, scanned and recorded. At the laboratory, each digital image was used to determine the three categories.

Measures: Live human observation and digital image were used to determine the number of pigs' engaged in touch, orientated and not orientated (Table 1). Pig percentages were calculated by dividing the total number of pigs classified in each category by the total number of pigs in the pen.

Table 1: Behavior classification of nursery pigs in a live human interaction test*

Measure	Description
Touch [1]	Any part of the pig's body touching the human observer
Oriented [2]	Pig oriented toward the human. Using Adobe Photoshop (Adobe Systems Incorporated, Arden Hills, Minnesota) in the digital image, a line was drawn from the midpoint between the pig's eyes to the center of the snout and then extended out towards the edge of the pen. If the line intersected with the human, the pig was classified as Orientated.
Not Oriented [3]	Pigs not exhibiting the above two behavioral classifications
	

***Statistical analysis*:** All data were evaluated for normal distribution before analysis by using the PROC UNIVARIATE procedure of SAS. A *P*-value of ≤ 0.05 was considered to be significant for all measures. Data were not normally distributed. These data were analyzed using the PROC GLIMMIX procedure of SAS. The main effect of pig sex (gilt vs. barrow) was compared for live and digital image. The statistical model included the random effect of room. A Poisson distribution was noted for this data, hence the I-Link option was used to transform the mean and SE values back to the original units of measure for data and results interpretation.

Results and Discussion

There was a trend towards more gilts approaching the human observer when using the live method (Table 2). However there were no ($P > 0.05$) differences for approachability between sexes when the digital image method was used (Table 3). In conclusion, for this age of pig there was no observed difference between gilts and barrows for touch, orientated and not categories when a human was in their home pen.

Table 2: Behaviors by sex of pig using the live method

	Sex		
Measure	**Gilt**	**Barrow**	***P*-value**
Touch			
No. pigs/pen	1.2 ± 0.5	2.2 ± 0.9	0.08
Percent of pigs	23.2 ± 7.2	14.0 ± 6.8	0.11
Orientated			
No. pigs/pen	2.5 ± 0.5	2.7 ± 0.6	0.72
Percent of pigs	28.5 ± 6.2	26.2 ± 5.6	0.74
Not			
No. pigs/pen	5.6 ± 1.2	4.5 ± 1.0	0.23
Percent of pigs	47.9 ± 12.1	60.1 ± 11.5	0.20

Table 3: Behaviors by sex of pig using the digital method

	Sex		
Measure	**Gilt**	**Barrow**	***P*-value**
Touch			
No. pigs/pen	2.3 ± 0.4	1.9 ± 0.4	0.52
Percent of pigs	20.3 ± 3.7	24.1 ± 3.3	0.40
Orientated			
No. pigs/pen	1.8 ± 0.5	2.5 ± 0.7	0.23
Percent of pigs	25.9 ± 6.4	19.3 ± 5.8	0.35
Not			
No. pigs/pen	5.4 ± 0.7	5.1 ± 0.8	0.73
Percent of pigs	53.4 ± 8.1	56.5 ± 7.3	0.72

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