RESEARCH ABSTRACT

ANIMAL WELFARE

Title: Building a handling course to document sow locomotion when sows are afflicted with different naturally occurring lameness **- #16-075 IPPA**

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Scientific Abstract:

Sow lameness is a major production disease affecting welfare and profitability (Anil et al., 2005). In 2014, Karriker and colleagues created a comprehensive swine lameness diagnostic manual which incorporated several diagnostic tools and pre- and post-mortem assessments. However; the manual had not been used to determine if it could classify lameness etiology. The objectives of this proposal were to (1) build a handling course (a ramp and wooden boards) and (2) to detail sow locomotion by identified lameness etiology from the manual. A wooden ramp and wooden boards were constructed. The ramp had the ascending and descending slopes set at 1.70 m (5.57 ft.) length x 0.82 m (2.69 ft.) internal width x 1.1 m (3.60 ft.) external width x 1.06 m (3.47 ft.) height. The ascending and descending slopes were at an 11° slope. Connecting the ascending and descending ramp is a walkway set at 1.21 m (3.96 ft.) length x 0.82 m (2.69 ft.) width x 1.06 m (3.47 ft.) height. Forty two cleats (0.71 m (2.32 ft.) length x 0.05 m (0.16 ft.) width x 0.02 m (0.06 ft.) height) were spaced at 0.16 m (0.52 ft.) intervals in both ascending and descending slopes (Figures 2, 3, 4). Ten wooden boards measured 0.08m (0.26 ft.) length x 0.76 m (2.49 ft.) width x 0.03 m (0.09 ft.) depth were spaced 0.3 m (0.98 ft.) apart and attached to a wooden frame. The wooden frame measured 3.12 m (10.23 ft.) length x 0.83 m (2.72 ft.) width x 0.08 m (0.26 ft.) height. A total of 58 commercially crossbred (PIC 1050; parity 1 to 8) were removed from their home pens and individually walked over the ramp and the wooden boards. One observer (who was standing outside the ramp and wooden boards and was hidden from the sow) recorded the time needed to traverse the ramp and wooden boards using a stop watch. Three color cameras (Panasonic, Model WV-CP-484, Matsushita Co. LTD., Kadoma, Japan) were positioned over the ramp and 2 color cameras (Panasonic, Model WV-CP-484, Matsushita Co. LTD., Kadoma, Japan) were positioned over

the wooden boards to record the animal-human interaction which was scored over five levels; (1) noise maker, (2) sorting panel, (3) handler's hands, (4) feed, (5) rattle paddle. After completion of the handling course a swine veterinarian used the swine lameness diagnostic manual to categorize lame sows into one of five etiology systems; (1) central nervous- (2) digestive-/metabolic issue (3) integumentary- (4) musculoskeletal- and (5) the peripheral nervous systems. Time and animal-human interaction were shown to be highly correlated and were therefore analyzed separately using generalized linear mixed model methods (PROC GLIMMIX) of SAS. The significance level was set at $P < 0.05$. A total of 20 sows were classified as non-lame (control etiology), and 38 sows displayed naturally occurring lameness. Of the 38 lame sows, 14 were classified as integumentary, 13 were classified as musculoskeletal and 11 were classified as the integumentary/musculoskeletal. Sows classified in the integumentary (100.63 seconds) and integumentary/musculoskeletal sows (88 seconds) traversed the ramp quicker than control (270.13 seconds) and musculoskeletal sows (175.03 seconds; $P = 0.02$). Lameness etiology was not a source of variation when comparing time to traverse the wooden boards (control sows: 54.45 seconds; integumentary sows: 29.94 seconds; musculoskeletal sows: 34.59 seconds; integumentary/musculoskeletal sows: 43.61 seconds; $P = 0.16$). Lameness etiology was not a source of variation when comparing time to traverse the handling course (control sows: 324.58 seconds; integumentary sows: 130.57 seconds; musculoskeletal sows: 209.62 seconds; integumentary/musculoskeletal sows: 131.61 seconds; $P = 0.19$). Lameness etiology was a significant source of variation ($P < 0.0001$) when comparing the animal-human interaction needed for sows afflicted with different lameness etiologies to traverse the ramp, with control sows needing the most interaction (19.05 interactions) compared to the other lameness etiologies (integumentary sows: 5.43 interactions; musculoskeletal sows: 13.19 interactions; integumentary/musculoskeletal sows: 6.01 interactions). Lameness etiology was not a source of variation ($P = 0.06$) when comparing the animal-human interaction needed for sows afflicted with different lameness etiologies to traverse the wooden boards. In conclusion, understanding how lameness etiology affects the sows movement and animal-human interaction can help in recommendations and on-farm education. This study is the first to assess the usefulness of the Swine Lameness Diagnostic Manual. Based on these behavioral results future studies need to include a. all the lameness etiologies, b. compare and contrast different obstacles, c. include more validated pain tools, and d. complete post mortem analysis.