

Impressions of Sow Overgrown Toes on U.S. Farms: What Environmental-Based Factors are Driving This?

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Summary and Implications

The purpose of this study was to poll farm managers regarding the environmental-based factors that may drive overgrown toes on-farm. All survey questions were self-reported by the participants. There was a total of 20 questions, which were separated into 6 different categories: farm demographics, flooring, sow characteristics, lameness, incidence of overgrown toes, and removal reason. The top 20 swine producing companies were chosen as potential survey participants by utilizing the Successful Farming Exclusive: Top 40 U.S. Pork Powerhouse List of 2020. Data will be presented descriptively (numbers and percentages). A total of 63 surveys (that encompassed 275,000 gilts and sows) were received. Half of the responses noted both types of gestation housing were used, and similarly, most used partial slatted flooring. The vast majority of participants reported that lactating sow flooring was cast iron. Over 75% of the participants reported that the gestation floors were “dry”. Just over 90% noted that their flooring had less than 25% fecal matter on the surface. Collectively, these reports provide a current inventory of what type of housing style, flooring material, and flooring conditions are in modern U.S. sow farms.

Introduction

Gilt selection based on feet structure is critical so that a robust female is successfully added into the breeding herd. Stalder et al., (2010) identified ideal gilt feet structure as large, square, evenly spaced toes with even toe size across the lateral and medial digit. The sow’s foot is comprised of 4 individual toes, also framed as digits or claws, two of which are weight bearing. The remaining two toes are often referred to as dew claws and they are non-weight bearing. All four toes can be further classified as lateral or medial depending on the proximity to the center of the pig (medial) or the outside of the pig (lateral). Typically, the lateral toe is slightly larger and thus, bears a larger portion of the sow weight. Selecting gilts with ideal feet structure will result in

better length of stay, profitability, improved sow welfare and caretaker morale. Gilt feet structure interplays with sow lameness and the most prevalent etiologies include overgrown toes and overgrown dew claws. Overgrowth occurs when the mean rate of hoof horn growth exceeds the mean rate of hoof horn wear. Most overgrowth evaluations are subjective assessments provided by the farm personnel. Reports on sow breeding populations indicate variable overgrown toe incidences from 4.5% to greater than 25%. The incidence rate along with the randomness of farm location, suggest that environmental factors such as flooring type, hygiene and housing may drive overgrown toe presentation. Therefore, the purpose of this study was to poll farm managers regarding the environmental-based factors that may drive overgrown toes on-farm.

Materials and Methods

This study was reviewed and approved as exempted research by Iowa State University Institutional Review Board (IRB: 21CFR56) for Human Subjects Research and complied with CFR 45 Part 46.

Survey development: A single survey instrument was created using the 2022 Qualtrics online software (Qualtrics Provo, UT, 2022). All survey questions were self-reported by the participants. There was a total of 20 questions, which were separated into 6 different categories: farm demographics, flooring, sow characteristics, lameness, incidence of overgrown toes, and removal reason. Fifteen questions allowed participants to select the one answer that best applied. A single question allowed multiple answers to be selected. Four questions were labeled “open ended” and allowed participants the option to respond with their own answer (Table 1). Questions highlighted in blue font will be included in this report. The Qualtrics survey was translated to Spanish via a translation company, Distynct (Ames, IA), whose employees have a comprehensive swine production background.

Statistical analysis: Data will be presented descriptively (numbers and percentages).

Results and Discussion

The survey was open for 72-d (May 20th, 2022, to July 29th, 2022). Surveys were considered “complete” if greater than 80 % of the questions were answered. A total of 63 surveys (that encompassed 275,000 gilts and sows) were completed with 56 surveys submitted directly by the farm using the 2022 Qualtrics online software and 7 submitted using Microsoft Word and were then entered into the Qualtrics software.

Half of the responses noted both types of gestation housing were used, and similarly, most used partial slatted flooring. The vast majority of participants reported that lactating sow flooring was cast iron (Figures 1, 2 and 3).

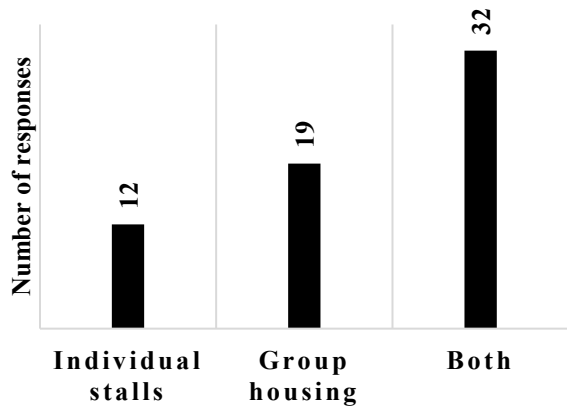


Figure 1. Gestation sow housing type on U.S. sow farms.

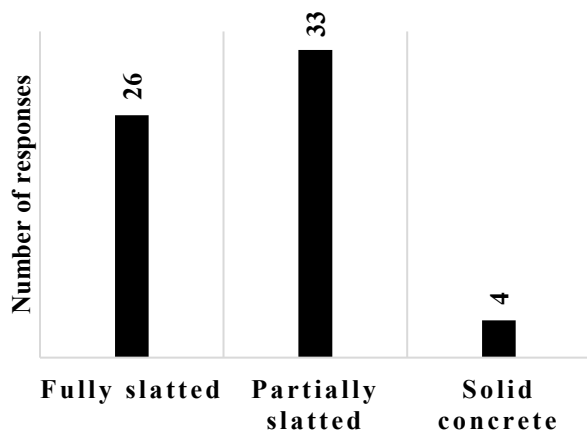


Figure 2. Gestation flooring found on U.S. sow farms.

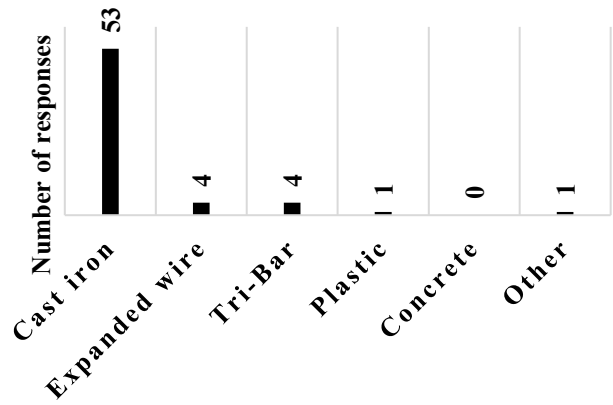


Figure 3. Lactation flooring found on U.S. sow farms.

Over 75% of the participants reported that the gestation floors were “dry”. Just over 90% noted that their flooring had less than 25% fecal matter on the surface (Figures 4 and 5).

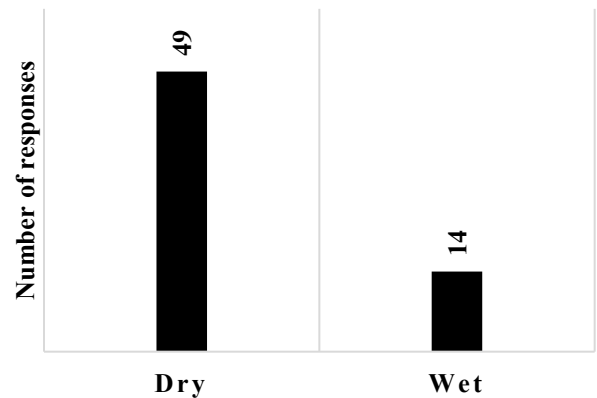


Figure 4. Farm managers impression of gestation flooring condition on U.S. sow farms.

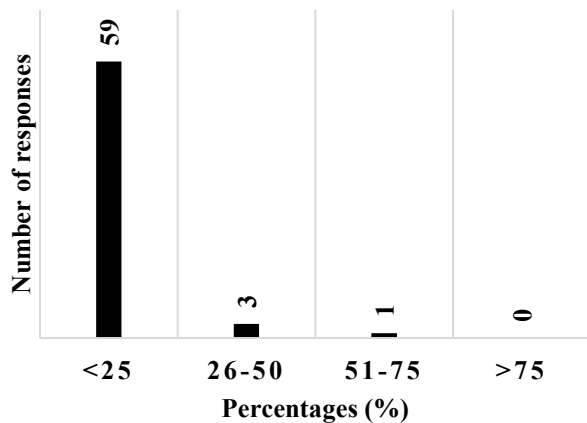


Figure 5. Farm managers impression of fecal matter coverage on U.S. sow farms.

It is important to note some survey limitations as it pertains to the results. First, all data were self-reported providing potential bias and thus, potentially impacting the outcome of the data analysis and the reported results. Second, this survey does not account for the genetic background of the sows, the early development of both gilts

and sows, the nutritional components of the feed and the variation of water quality. These unknowns and the potential farm to farm variability of these components could also have altered the responses submitted in the survey. Additionally, a vast majority of farms present in this survey reported being from midwestern states where external climates and environments tend to be similar. Therefore, sow farms from other locations with differing weather patterns and climates may experience environmental factors that are different from the current data sample collected from this study. In conclusion, most farm managers reported that the condition of their barns were clean, dry areas. Almost all farms used some form of slatted flooring during gestation while cast iron was the predominant flooring in lactation. Over half of the survey takers stated their farms utilized both group and individual housing for their sows. Collectively, these reports provide a current inventory of what type of housing style, flooring material, and flooring conditions are in modern U.S. sow farms.

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Table 1. Survey questions with response options and answer response styles.

Question	Options	Answer style
<i>Farm demographics</i>		
In which state is the sow farm located?	All U.S. States	Open ended
What is the age of the sow farm? (Yr)	<5	Select the answer that best applies
	6-10	
	11-20	
	>20	
How many sows and gilts are on this farm? (Number)		Open ended
Gestating housing type of the farm?	Individual Stalls	Select the answer that best applies
	Group Housing	
<i>Flooring</i>		
Flooring type in gestation	Solid concrete	Select the answer that best applies
	Partially slatted	
	Fully slatted	
Flooring type in lactation	Cast iron	Select the answer that best applies
	Expanded wire	
	Tri-bar	
	Plastic	
	Concrete	
General flooring hygiene in gestation?	Wet	Select the answer that best applies
	Dry	
Gestation stall or pen covered in fecal matter? (%)	<25	Select the answer that best applies
	25-50	
	51-75	
	>75	
<i>Sow</i>		
What type of gilt production system does your farm utilize?	System internal gilt production	Select the answer that best applies
	Purchase replacement gilts	
What is the average parity over the past 12 mo?	Parity 1	Select the answer that best applies
	Parity 2	
	Parity 3	
	Parity 4	
	Parity 5	
	Parity 6	
	Parity 7	
	Parity 8 or older	

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Question	Options	Answer style
What is the approximate average body condition score in gestation (just prior to farrowing) over the past 12 mo?	BCS 1 (thin)	Select the answer that best applies
	BCS 3 (ideal)	
	BCS 5 (fat)	
What is the overall farm consistency of BCS?	Low	Select the answer that best applies
	Medium	
	High	
<i>Lameness</i>		
What is your most prevalent reason for observed sow lameness that occurs on the farm you manage or supervise?	Dew claw	Select the answer that best applies
	Foot lesions	
	Joint issues	
	Long/Overgrown toes	
	Other	
When does sow lameness most often occur on the farm you manage or supervise?	Lactation	Select the answer that best applies
	Breeding	
	Gestation	
What foot issues do you most commonly see among the sows on the farm you manage or supervise?	Hoof wall cracks	Select all answers that apply
	Pad lesions/cracks	
	Severely overgrown toes	
	Uneven toes	
<i>Overgrown toes</i>		
What is the most frequent location for long toes when it is observed on the farm you manage or supervise?	Front feet	Select the answer that best applies
	Rear feet	
	All feet	
What percentage of sows have overgrown toes on your farm?	<5	Select the answer that best applies
	6-10	
	11-15	
	>15	
Among the sows, what parity do you most often recognize toe overgrowth in the sow herd you manage or supervise?	Between parity 1 and 2	Select the answer that best applies
	Between parity 2 and 3	
	Between parity 3 and 4	
	Between parity 4 and 5	
	Older than parity 5	
Do you currently practice trimming overgrown toes on breeding herd sows?	Yes	Select the answer that best applies
	No	

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Question	Options	Answer style	Options
<i>Removal reason</i>			
What is the primary reason for culling sows from the breeding herd on the farm you manage or supervise?	Age	Select the answer that best applies	
	Body condition score		
	Performance		
	Reproductive failure		
	Structure		