

## Characterization of U.S. Cull Sows

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### Summary and Implications

Physical and reproductive conditions of cull sows (3,158) from two U.S. Midwestern harvest plants were assessed. Body condition, feet, shoulders, teeth, lungs, and reproductive tracts were visually evaluated for gross lesions on harvested sows. From the observations of this study, body condition score (BCS) was associated with several abnormal conditions of sows. Whether the lesions caused BCS to change, BCS caused the lesions, or the lesions and BCS changed simultaneously is unknown. Most of these abnormal conditions are difficult to reliably observe by production personnel in the farm setting. Observation and attention to BCS may serve as an indicator of other lesions that have the potential to lessen the productivity of the sow.

Causative relationships were not established by this study. However, the strong associations observed suggest that sows that do not respond to increased feeding with improved BCS on farm could reasonably be expected to have additional lesions that may have poor prognosis for high performance. The prevalence of reproductive lesions detected in the current study was substantially lower than the reported percentage of sows culled for reproductive failure in previous farm based studies. Additional characterizations may be able to relate on-farm management practices to one or more lesions that had a high occurrence in the present study.

### Introduction

Traditional culling studies are based on retrospective farm data as they are easy and economical to obtain. Producers typically report one reason for culling each sow without reporting of co-morbid conditions. Additionally, these reasons are typically based on external signs or indications and do not incorporate evidence of internal lesions or results from diagnostic testing. Sow harvest plants offer researchers an opportunity to confirm farm data and to characterize and enumerate factors which may cause culling. However, studies investigating the presence of

gross lesions in harvest plants are few. Post-mortem examinations of female pig reproductive organs are a potential source of information concerning sow reproductive failure. Foot lesions, body condition, disease status, and other problems may also contribute to sow culling decisions. The objective of this study was to characterize the physical condition of cull sows from U.S. Midwestern sow harvest plants.

### Materials and Methods

Harvest populations were chosen to represent the range of sows culled from U.S. pork operations. Because the type of sows harvested by individual facilities is driven by varied purchasing criteria based on anticipated output from those facilities, we chose two different Midwestern plants for data collection. Body condition, feet, shoulders, teeth, lungs, and reproductive tracts were visually evaluated for gross lesions on harvested sows.

### Results and Discussion

The frequency of lesions measured on cull sows by BCS at two Midwestern harvest facilities are presented in Table 1.

In the present study rear pad lesions generally increased as BCS increased. One possible explanation for these results is that sow weight generally increases as BCS increases, which may result in increased pressure and damage to the rear pad.

Increased rear and front cracked toes were associated with decreasing BCS. This could suggest dietary deficiency as an impact on toe integrity if decreased body condition is a result of reduced feed intake or feed restriction.

Frequency of acyclic ovaries was higher in the BCS 1 category (20.6%) when compared to the BCS 4 category (4.2%). Because protein loss was unknown in the present study, it is not clear if it contributed to acyclic ovaries in a similar manner to that observed in previous studies. However, it could reasonably be assumed that sows in the BCS 1 category likely had at least some body protein loss and hence, this may have contributed to the greater prevalence of acyclic ovaries in the lower BCS sows.

A higher incidence of cystic ovaries was associated with a higher BCS. These results could be influenced by weaning age or failure to conceive. Sows weaned earlier may lose less body condition from lactation demands when compared to later weaned sows and have been shown to have more cystic ovaries.

Pneumonia, pleural adhesions, and peritonitis increased as BCS decreased. Good management of sow body condition may reduce the incidence of disease and other lesions associated with lower BCS sows.

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**Table 1. Frequency of lesions by BCS<sup>a</sup> on 3,158 cull sows evaluated at two U.S. Midwestern harvest facilities in 2005.**

Trait	BCS				P- value <sup>b</sup>
	1	2	3	4	
Front feet					
Pad lesions, %	26.3	35.4	32.6	33.1	.41
Cracked toes, %	32.9	24.9	20.4	17.6	.01
Overgrown toes/dew claws, %	6.3	5.3	2.7	0.5	.01
Abscesses, %	2.3	0.3	0.6	0.3	.02
Missing dew claws, %	0.7	0.1	0.1	0.0	.03
Rear feet					
Pad lesions, %	55.1	68.5	68.6	70.8	.01
Overgrown toes/dew claws, %	26.5	22.2	21.3	12.6	.01
Cracked toes, %	19.1	20.7	17.7	12.6	.01
Missing dew claws, %	3.7	6.5	4.7	3.0	.16
Abscesses, %	6.1	7.8	2.9	1.1	.01
Ovaries					
Normal, %	76.6	85.2	85.1	87.7	.01
Acyclic, %	20.6	9.9	7.6	4.2	.01
Cystic, %	2.8	4.8	7.3	8.1	.01
Pregnancy					
Pregnant, %	6.7	4.8	6.2	6.3	.56
Normal, %	3.9	4.0	5.8	6.0	.04
Mummified, %	2.8	0.1	0.3	0.3	.01
Decomposed, %	0.0	0.7	0.1	0.0	.16
Systemic lesions					
Pneumonia 1- 10% <sup>c</sup>	6.2	6.9	4.2	2.6	.01
Pneumonia > 10% <sup>d</sup>	13.2	6.4	2.6	3.1	.01
Pleural adhesion, %	11.0	7.4	4.1	3.7	.01
Peritonitis, %	8.2	2.2	0.6	0.5	.01
Shoulder lesions					
None, %	60.8	69.8	90.4	96.1	.01
Abrasions, %	21.6	20.4	8.3	3.9	.01
Open, %	16.9	8.9	1.2	0.0	.01
Abscesses, %	0.7	0.9	0.1	0.0	.01
Teeth wear					
Minimum, %	16.0	10.3	8.3	16.1	.85
Moderate, %	53.5	42.6	46.7	52.8	.24
Severe, %	30.6	47.1	45.2	31.1	.3
Teeth					
Top teeth, no.	21.3 <sup>ef</sup>	21.4 <sup>f</sup>	21.3 <sup>ef</sup>	21.2 <sup>e</sup>	
Bottom teeth, no.	21.5 <sup>e</sup>	21.8 <sup>f</sup>	21.8 <sup>f</sup>	21.7 <sup>ef</sup>	

<sup>a</sup>BCS = Body condition score (possible range 1 to 5, Patience and Thacker, 1989).

<sup>b</sup>P- value= tests the linear association between trait and BCS.

<sup>c</sup>% of sows with pneumonia and 1- 10% lung involvement.

<sup>d</sup>% of sows with pneumonia and > 10% lung involvement.

<sup>ef</sup>Row means with different subscripts differ (P < 0.05).