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The 2009 Allen D. Leman conference proceedings book is made possible by the generous support of **IDEXX**.

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Formatting

Tina Smith

CD-ROM

David Brown

Logo Design

Ruth Cronje, and Jan Swanson;
based on the original design by Dr. Robert Dunlop

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Analysis of the association between the numbers of lesions in different claw areas in sows

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Claw lesions are very common in pigs. Damage to claws is often the initiating factor for lameness in pigs. Claw lesions cause lameness by acting as a source of pain. Infections may enter through the lesions and may spread upwards, leading to infections in the foot. The major reported factors associated with claw lesions are the interaction between the floor surface and the horn of the claw, physical properties of the floor and nutrition.

It is important to minimize the incidence of claw lesions in order to reduce the removal of sows due to lameness. However, the exact pathway in the development of lesions in pigs is not well understood. Although, properties of the floor (rough vs. smooth or solid vs. slatted) are suggested to be associated with the development of lesions, the development of lesions in different claw areas (heel, sole, heel-sole junction, white line and side wall) is difficult to be explained as caused by the physical properties of the floor or by the interaction between the floor surface and claw horn alone. This is suggestive of the existence of predisposing factor/s for the development of claw lesions. It is important to see whether lesions in different claw areas are independent of each other in order for this hypothesis to be developed further.

In the present study we aimed to analyze the correlations (Spearman rank correlation, SAS v 9.1) between the numbers of lesions in different claw areas (in lateral and medial claws and in front and hind limbs) of 229 sows housed in conventional gestation stalls at the University of Minnesota SROC, Swine Research Center at Waseca. The claws were examined for lesions between days 60-70 of gestation using a mechanical restraint developed for the purpose. Significant ($P < 0.05$) positive correlations

were observed between the total number of lesions in lateral and medial claws, total number of lesions in hind limbs and fore limbs, long claws and long dew claws (correlation coefficient 0.2 for all), heel lesions and overgrown heels (correlation coefficient 0.5), heel lesions and vertical side wall cracks, heel-sole junction lesions and vertical side wall cracks (correlation coefficient 0.2 for both), white line lesions and sole lesions (correlation coefficient 0.14), horizontal side wall cracks and sole lesions, and vertical side wall cracks and sole lesions (correlation coefficient 0.17 for both). Heel-sole junction lesions were negatively correlated with ($P < 0.05$) long claws and long dew claws (correlation coefficient -0.13 for both).

Analyses indicated that claw lesions are not independent in occurrence. Significant correlation between the total number of lesions in front and hind limbs in stall housed sows is suggestive of a common underlying predisposing factor in the development of lesions. A positive correlation between long claws and long dew claws may be indicative of a systemic defect in claw horn growth. The higher possibility of injuries to overgrown heel may explain the positive relationship between heel lesions and overgrown heels. The other relationships observed may have a biomechanical basis warranting further studies.