

Introduction

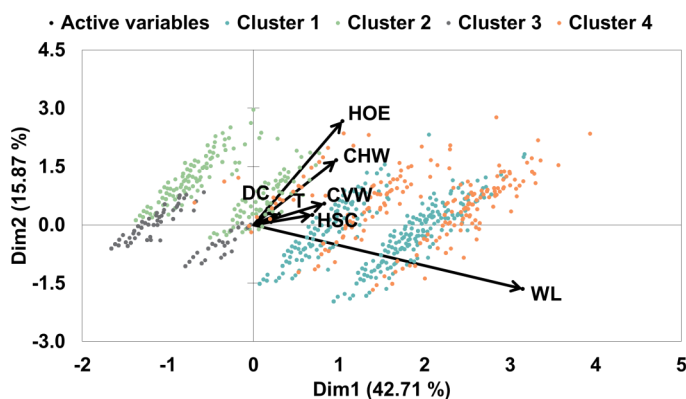
Claw lesions are a welfare and economic concern for the swine industry worldwide. Analytical techniques combined with multivariate analysis can be helpful in analyzing datasets of claw lesions in sows.

Experimental Design

Sows from 20 Brazilian sow herds, were randomly selected (10% of the sow inventory; n = 3583) and scored for lesions on the hind legs after parturition.

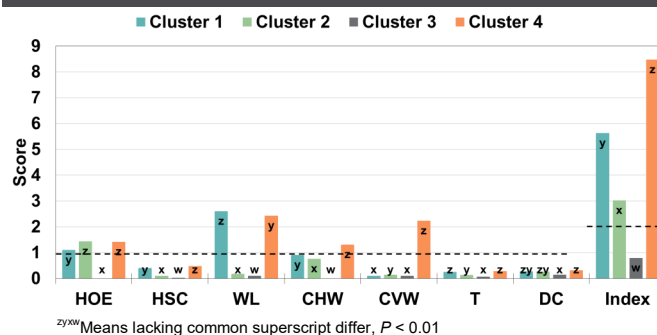
Lesion scores were based on a four-point scale (0 = no lesion to 3 = severe lesion), including heel overgrowth and erosions (HOE), heel-sole crack (HSC), separation along the white line (WL), horizontal (CHW) and vertical (CVW) wall cracks, overgrown toes (T) and torn (dew-) claws (DC). Additionally, a lesion index (L-Index) was calculated as a sum of the higher scores from each lesion, per sow.

Herd/sow information was collected to allow for sows to be grouped by similarities into four clusters by k-means clustering.

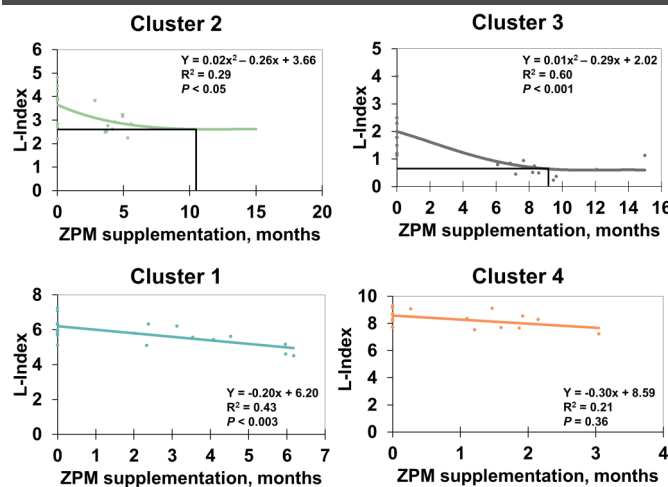


Information collected was used to predict lesions using partial least square regression (PLS-R). A quadratic response plateau (QRP) model was fitted to assess the interrelationships between the change in L-Index and the duration of mineral-amino acid complex supplementation.

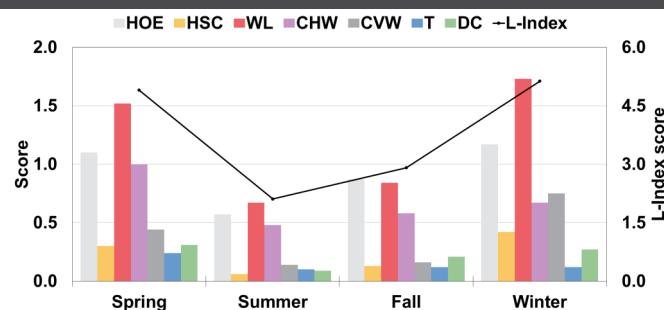
Claw Lesions Based on Clusters



Reduction in L-Index of Cluster 1 and 3 with Zinpro Performance Minerals (ZPM)



Claw Lesion Type and Severity was Influenced by Season



Results

Sow markedly differed for claw lesion type and severity, which may be influenced by season of the year, and impact on their responsiveness to Zinpro Performance Minerals supplementation.

Seasonality as the major factor influencing claw lesion type and severity in lactating sows, which may affect their responsiveness to mineral-amino acid complex supplementation: a case study

Ton Kramer¹, Alan Klein¹, Alyssa Cornelison¹, Wesley Schweer¹, Mike Socha¹, Lucas Rodrigues¹, Geraldo Camilo Alberton²

¹Zinpro Corporation, Eden Prairie, MN 55344

²Federal University of Parana, Palotina Sector, Palotina, PR, Brazil 85950-000

Presenting author: Ton Kramer; tkramer@zinpro.com

Introduction: Claw lesions are a welfare and economic concern for the swine industry worldwide. Analytical techniques combined with multivariate analyses can be helpful in analyzing large datasets of claw lesions in sows.

Methods: A total of 20 Brazilian pig herds were selected. Sows ($n = 3583$) (10% of inventory size within each herd, up to a maximum of 100 sows per herd) were randomly selected and scored from 0 [(no lesions) to 3 (severe lesions)] for claw lesions in the hind legs after parturition (Deen et al., 2009). Lesions included heel overgrowth and erosion (**HOE**), heel-sole crack (**HSC**), separation along the white line (**WL**), horizontal (**CHW**) and vertical (**CVW**) wall cracks, and overgrown toes (**T**), or torn (dew-) claws (**DC**). A lesion index (**L-Index**) was calculated as the sum of the higher scores from each lesion, per sow. Information about mineral- (zinc, manganese, and copper) amino acid complex supplementation (**ZN**; supplemented or not) and duration of supplementation (**ZN-T**; months), season of evaluation (fall, winter, spring, summer), herd type (commercial vs. multiplier), inventory size [(small, < 550), (mid, 550 – 1050), (large, 1050 – 3250)], and parity (1 to 7+) were collected. Sows were grouped by similarity in four clusters (C1, C2, C3, and C4) by *k*-means clustering. The information collected (e.g., mineral-amino acid complex supplementation, season, inventory size, herd type) was used to predict lesions using partial least square regression (**PLS-R**). Predictors with a variable of importance for projection (**VIP**) greater than one, which were ZN, ZN-T, and season, were used in the final model. A quadratic response plateau (**QRP**) model was fitted to assess the interrelationships between the change in L-Index and the duration of mineral-amino acid complex supplementation.

Results: Cluster 1 (1197 sows) and C2 (1080 sows) had higher scores for WL and HOE, respectively, while C3 (931 sows) had the lowest scores for all lesion types and C4 (375 sows) had greater scores for CHW, CVW, WL, HSC, HOE, and L-Index ($P < 0.05$). Mineral-amino acid complex supplementation reduced CHW, HSC, and DC, regardless of Cluster ($P < 0.05$), reduced HOE in C1 and C4 sows only ($P < 0.05$), and did not impact WL in C1 and C4, and CVW and T in C4 ($P < 0.05$). Sows from C2 and C3 achieved a plateau on L-Index of 2.62 and 0.60 at 8 and 10 months of mineral-amino acid complex supplementation, respectively ($P < 0.05$). The QRP model was not significant for C1 or C4 sows ($P > 0.05$). Sows had greater scores for HOE, CHW, T, and DC during spring and greater scores for HOE, HSC, WL, and CVW during winter ($P < 0.05$). Sows evaluated during summer had the lowest scores for all the lesion types ($P < 0.05$).

Conclusions: There was a marked differentiation among sows in claw lesion type and severity, which was mainly orchestrated by the year's season, with sows evaluated during spring and winter showing greater scores. This differentiation may be associated with an altered response to mineral-amino acid complex supplementation.

Deen, J., Schuttert, M., Van Amstel, S., Ossent, P., & Van Barneveld, R. (2009). Feet first from Zinpro: lesion scoring guide. Zinpro Corporation, Eden Prairie, MN, USA.

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