

# Research Now

## Zinc, Manganese and Copper as Availa® Sow Decreases Claw Lesions in Sows

### Introduction:

Lameness is a major reason for decreased sow longevity in swine breeding herds. Claw lesions have been reported to be associated with lameness in sows. Housing conditions and management on the farm are important for the development of claws and prevention of claw lesions in pigs. Nutrition, especially trace minerals, may also act as a predisposing factor. This study hypothesized that dietary supplementation of trace minerals in the form of complexed trace minerals (CTM, Availa® Sow [zinc, manganese, copper]) would decrease the prevalence of claw lesions in breeding female pigs.

### Experiment Design:

- Inorganic trace minerals (ITM) compared to feeding CTM at iso total mineral inclusion of Zn, Mn and Cu
- 62 (ITM) and 57 (CTM) sows per treatment
- 124 (ITM) and 113 (CTM) observations

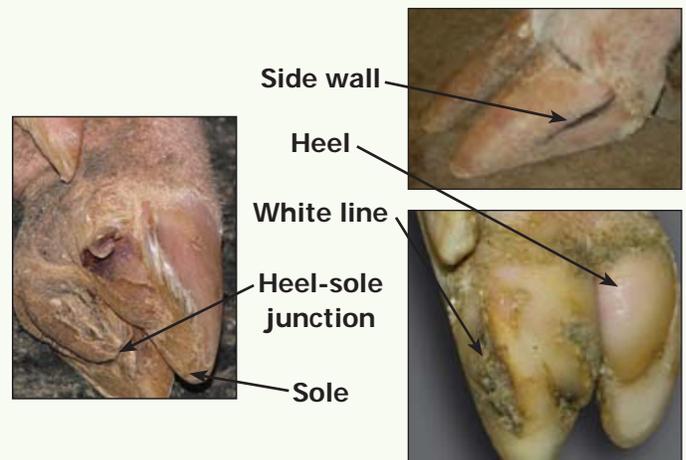
### Results:

Feeding CTM (Availa-Sow) to gestating and lactating sows:

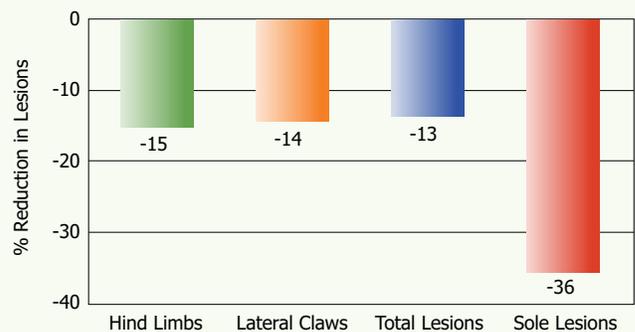
- Decreased hind limb lesions 15%
- Decreased lateral claw (weight bearing claws) lesions 14%
- Decreased total claw lesions 13%
- Decreased sole lesions 36%

### Measuring Claw Lesions

- Lesion evaluation by Feet First® Lesion Scoring Guide
- Sows lifted by Feet First Chute™
- Measured at mid-gestation in two consecutive parities
- Lesions recorded for lateral, medial claws, front and rear limbs
- Lesions were counted in different claw areas



### Decrease in Lesion Numbers When Feeding CTM (Availa-Sow)



# Abstract

## Evaluation of the supplementation of complexed trace minerals on the number of claw lesions in breeding sows.

S. S. Anil<sup>1</sup>, J. Deen<sup>1</sup>, L. Anil<sup>1</sup>, S. K. Baidoo<sup>1</sup>, M. E. Wilson<sup>2</sup> and T. L. Ward<sup>2</sup>  
<sup>1</sup> University of Minnesota, St. Paul, MN, <sup>2</sup> Zinpro Corporation, Eden Prairie, MN

Lameness is a major reason for decreased sow longevity in swine breeding herds. Claw lesions, especially severe white line and side wall lesions are reported to be associated with lameness in sows. Despite the high prevalence of claw lesions, minimal research has focused on claw lesions in pigs and continues to be a limiting factor in development of management practices to reduce claw lesions and lameness. Although housing conditions and management on the farm are important for the development of claws and prevention of claw lesions in pigs, nutrition, especially of trace minerals may also act as a predisposing factor. Nutrition is vital in developing the hoof structure and the importance of trace minerals in the keratinisation process has been reported previously (Tomlinson et al., 2004). Feeding complexed trace minerals reduced the number of dairy cows culled before wk 36 postpartum and improved claw integrity compared to cows fed sulphate trace mineral diet (Siciliano-Jones et al., 2008). This study, hypothesized that dietary supplementation of complexed trace minerals (CTM, bonding individual trace minerals to single amino acids) would reduce the prevalence of claw lesions in breeding female pigs. The present study was conducted to determine the effect of a partial substitution of CTM of Zn, Mn and Cu for ordinary inorganic sulphate trace minerals (TIM) in breeding female pigs. The key response variable, number of claw lesions, was measured across two consecutive lactations and the intervening gestation.

This study used 237 commercial cross sows of mixed parity, randomly allotted to one of two treatments and housed in conventional gestation stalls at the research station of the University of Minnesota. The sows were fed either a control diet, ITM (N=124; Zn 125 ppm, Mn, 40 ppm and Cu, 15 ppm) or CTM diet (N=113) a partial substitution of inorganic minerals for (Zn, 50 ppm, Mn, 20 ppm and Cu at 10 ppm) fed at iso levels of mineral supplementation. The lesions in different claw areas (side wall, heel, white line, heel-sole junction and sole) of these sows were counted by a trained person in two consecutive parities at mid-gestation using a mechanical chute designed for the purpose. The total numbers of lesions in different claw areas, in lateral and medial claws and in front and hind limbs were obtained by adding up the component counts. The associations of supplementing trace minerals with the number of lesions were analyzed (Univariate analyses, Proc Genmod, SAS V 9.1) using Poisson regression or Negative binomial regression with sow as a repeated variable (Table 1).

Table 1. The associations of supplementing complexed trace minerals with the number of claw lesions in stall-housed sows (ITM, N=124; CTM, N=113)

Variables	Parameter Estimate	P value
Total number of hind limb lesions	0.1611	0.041
Total number of lateral claw lesions	0.1445	0.059
Total number of lesions	0.1352	0.064
Total number of sole lesions <sup>a</sup>	0.4461	0.043

<sup>a</sup> Poisson regression

Results indicated that the sows in the ITM group had 17% more ( $P < 0.05$ ) lesions on the hind limbs than the sows in the CTM group. Both the total number of lesions as well as the number of lesions on lateral claws tended to be higher ( $P < 0.07$ ; 14 and 16% respectively) among sows fed ITM. Sows fed ITM had 56% more ( $P < 0.05$ ) lesions on the sole than sows fed CTM. The results of this study support the beneficial effect of feeding CTM to decrease claw lesions in breeding female pigs.

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