

## **Final Research Report**

### **Comparison of regional limb injection to systemic medication for the treatment of septic lameness in breeding female swine**

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#### **Statement of the Problem:**

Lameness in swine is a topic of animal welfare and economic concern. Lameness is an important cause of involuntary culling with rates as high as 15% and infectious arthritis has been reported to be the second most important cause of lameness in culled sows. Currently, the treatment of septic lameness in swine involves systemic antibiotic and anti-inflammatory therapy.

#### **Objectives:**

The purpose of this study is to introduce and evaluate the efficacy of regional intravenous limb perfusion (RILP) with antimicrobials as an additional treatment for septic lameness in swine.

#### **Materials and Methods:**

##### *Patient selection and observation*

Case selection occurred as gilts and sows were being loaded into farrowing crates. Breeding females were observed for lameness as they were washed and loaded. The feet of lame animals were palpated for heat and swelling, indicating a probable infectious cause. Gilts and sows were kept in farrowing crates until weaning, with weekly observations and a final observation after removal from the farrowing barn. Sows in gestation barns were observed and included in the study using the same criteria and post-treatment protocol.

All pigs in each cohort of breeding groups were issued a lameness score. Subjects that scored a Grade 2 out of 3 with acute lameness localized to the distal limb/foot were included in this study. Acute, septic lameness was demonstrated by the presence of swelling and heat. Chronic lesions, characterized by the presence of exuberant granulation tissue, were not included in this study.

##### *Treatment*

Selected subjects were randomly assigned to a treatment groups using a random number generator.

##### Control group treatment

The control group received three systemic treatments of lincomycin every 24 hours at a dose of 11 mg/kg intramuscularly (IM) in the neck, based on visual appraisal of weight.

##### Regional Intravenous Limb Perfusion

Regional intravenous limb perfusion was performed by restraining the animal using a snare, followed by the application of a 3.75 cm wide rubber tourniquet to the mid-metacarpal or metatarsal region of the affected leg. A 21-gauge butterfly catheter was inserted into the dorsal common digital vein. Lincomycin (100 mg) was diluted in 3 mL of 0.9% sterile saline and administered through the catheter, followed by a flush of air to clear the catheter and the animal was released. The tourniquet was left in place for 30 minutes. This was repeated once a day for three consecutive days.

#### *Follow up*

Animals were evaluated weekly for four weeks after treatment. Symptoms of interest were: unwillingness to bear weight, swelling or heat in the affected foot, and wounds on the foot. Absence of these signs indicated a resolution of the previously diagnosed lameness. Parity, body weight and affected limb were recorded for each animal.

This study was reviewed and approved by the Texas A&M University Institutional Animal Care and Use Committee.

#### **Results:**

We observed no significant difference between systemic or regional limb perfusion treatments. Average parity of the 20 acquired study animals was 1.9 parities. Eleven of the animals were administered the RLIP treatment. The majority of lameness was recognized in the left hind limb.

The systemic route of administration conveyed a 57.1% resolution rate by day 7, 66.7% by day 14, and 88.9% after day 21. Four weeks post-systemic treatment was similar to three weeks post treatment. Regional limb perfusion had a 62.5%, 72.7% and 81.8% resolution respectively. Observed successes were 75% for the RLIP group due to culling. No animals were observed to revert back to lameness after treatment during the study period.

#### **Implications:**

- RLIP may result in a quicker resolution of lameness with less antimicrobial drug compared to systemic treatment.
- A majority of lameness was cured given extended time after treatment in normal farrowing or pen gestation housing.
- While RLIP reduces the amount of antimicrobial used, it is considered extralabel use and requires the necessary justifications and withdrawal time extensions.