RESEARCH ABSTRACT

ANIMAL WELFARE

Title: Development of a practical, cost-effective pain mitigation technique for castration of piglets – NPB #12-107 revised

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Scientific Abstract:

Introduction: The main objective of this experiment was to develop an effective, cost-effective and practical method of mitigating pain associated with castration in piglets. **Materials and Methods:** The study was performed in 3 parts. Part 1 examined the efficacy and onset time of lidocaine using two different administration systems. Thirty 3-4 days old male piglets were randomly assigned to receive one of the following: 1) lidocaine 1%(14 mg) administered by needle free injection (ACUSHOT); 2) lidocaine 1% (15 mg) administered by a needled multi-injection syringe (NEEDLE); or 3) untreated control group (SHAM). Pain during and after castration was measured using behavior, vocalizations, serum cortisol and lactate, force algometry and infra-red thermography over six hours. Part 2 examined the effect of lidocaine administered by a needled, multi-injection syringe on vocalizations and pain scores (VAS) during anesthetic administration and castration. 120, 2-3 days old male piglets were randomly assigned to receive one of the following: 1) handling but no anesthetic administration and castration after 2 minutes(CONT); 2) lidocaine 1% (15 mg) and castration after 2 minutes (LIDO 2); or 3) lidocaine 1% (15 mg) and castration after 4 minutes (LIDO 4). Lidocaine was administered using a multi-injection needled syringe. Part 3 implemented the injection technique into a production setting compared to standard processing procedures to assess the cost and time implications on production. Twenty-four litters were randomly assigned to either a lidocaine or untreated control group. Times to process each litter, each row, and to administer the lidocaine were measured. Individuals performing the processing on the farm were given a questionnaire. **Results:** Part 1: ACUSHOT was found to not reliably inject the anesthetic. NEEDLE was 92% effective after 2 minutes. There were no significant differences between any group or over time in serum cortisol, blood lactate, or pressure algometry. SHAM piglets tended to have a higher maximum frequency and high frequency (>1000Hz) call rate than NEEDLE, however these results were not statistically significant. Part 2: Lidocaine (LIDO2 and LIDO 4) significantly decreased VAS and increased low frequency call rates. Maximum frequency and high frequency call rates were also lower in LIDO 4 compared to CONT. There was no significant effect on time to process each litter or corrected row processing times when local anesthetic was incorporated into routine piglet processing on the farm, in a 2 cart system with 2-3 processors. Material costs were less than $1 USD per litter. Processors felt that the technique was easy and safe to perform and that they could make the technique work if it were adopted within their system.
Conclusions: The results of this study suggest that local anesthesia using lidocaine and a multidose, needle syringe is effective, easy to perform, economic and practical for use in a production setting.