Title: Translactational analgesia to reduce pain during piglet castration - NPB #:12-063

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Scientific Abstract

The cost of drugs and the additional labor required to administer analgesics to individual piglets reduces the likelihood of their adoption by producers when conducting painful procedures. This study examined the feasibility of a novel approach for providing analgesia at castration, using the sow as the vehicle to deliver an analgesic to the entire litter. The work was completed in two parts. The first studied the kinetics of drug absorption and distribution. Twelve sows were injected with 0.5, 0.75 or 1.0 mg/kg of Metacam® at 7 days after parturition and serial blood and milk samples were collected over a 5 hour period. Study sows were high producing animals (12 or more live piglets per litter) in their 3rd or 4th parity. Drug levels in plasma and milk were measured by LC-MS. Metacam® concentrations in sow plasma peaked at 1 h post injection, averaging 468 ±136, 438 ±143 and 501 ±338 ng/ml for the 0.5, 0.75 and 1.0 mg/kg treatments, respectively. The average drug concentration in milk across treatments peaked at 215 ng/ml at approximately 3 h post injection, with concentrations of 105 ±18, 352 ±467 and 184 ±92 ng/ml, respectively, for the three treatments. A second study was performed to determine the amount of drug absorbed by piglets at nursing. Twelve sows were injected with 1.0 mg/kg of Metacam®. Over 4.5 hours, serial milk samples were collected from each sow and serial blood samples were collected from 2 male piglets per litter. Analgesic concentrations in piglet serum were found to increase over time, from 0.44 ng/ml at 45 minutes, to 2.65 ng/ml at 295 minutes. Piglet serum levels were thus less that 1/100th of the levels in sow serum. Based on these results it was determined that translactational transfer of Metacam® is unlikely to be sufficient to provide therapeutic pain relief following castration. However, a modified form of the drug, or alternative drugs such as Ketoprofen®, may be more readily transferred via the milk. While this method has the potential to significantly reduce labor requirements for handling and injecting piglets, the large amount of drug required in sows to provide adequate transfer to piglets remains problematic due to toxicity and cost concerns. It is possible that, with the use of alternative drugs, this technique could become a viable approach for the hog industry.