

ANIMAL WELFARE

Title: Methods to reduce the pain associated with castration – **NPB #08-084**

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Scientific Abstract:

Surgical castration of male piglets is a common management practice carried out on commercial swine farms to prevent aggressive behavior and the occurrence of boar taint. However, the procedure of surgical castration causes acute pain induced distress which is an animal welfare concern. The objective of this study was to examine novel methods (needle-free injection systems or topical) to potentially alleviate the pain induced distress caused by castration in piglets as measured by known physiological and behavioral indices of castration stress in piglets. At 3 d of age, seven weight matched piglets from 10 sows were allocated to one of seven treatment groups. Treatments included: 1) Sham castration (CON; n = 10); 2) Surgical castration (CAS; n = 10); 3) Castration plus local anesthetic administered 10 minutes prior to castration using a conventional needle and syringe (LA-10; n = 10); 4) Castration plus local anesthetic administered just prior to castration using a conventional needle injection (LA-0; n = 10); 5) Castration plus local anesthetic administered just prior to castration using a needle-free injection system (Pulse; n = 10); 6) castration plus long acting topical anesthetic applied to the castration wound (LONG; n = 10), and 7) castration plus short acting topical anesthetic applied to the castration wound (SHORT; n = 10). Blood samples were collected from pigs prior to and 30, 60, 120, and 180 min after castration to measure leukocyte and differential counts and cortisol concentrations. The above experiment was repeated without blood collection and behavior was recorded using 1-min scan sampling for 60 min prior to and 180 min after castration with or without analgesia and control handling. All piglets were weighed prior to and 24 h after castration and wound healing was recorded daily for 14 d after castration. Cortisol concentrations were elevated ($P < 0.06$) in CAS, LA0, LA10, Pulse, SHORT, and LONG piglets compared with CON pigs 30 and 60 min after castration. Cortisol concentrations were elevated ($P < 0.05$) in LONG piglets 30, 60, 120, and 180 min after castration compared with CON piglets. Piglets injected with local anesthetic 10 min prior to castration vocalized less ($P < 0.005$) than piglets castrated without analgesia. Body weight change did not differ ($P > 0.05$) among treatments 24 hours after castration or control handling and wound healing scores were greater ($P < 0.05$) in SHORT piglets compared with all other treatments. In the current study, the use of local anesthetic administered at the time of castration or topical anesthetic was not effective in reducing the pain induced distress caused by castration in piglets. While long-lasting analgesic application may reduce short-term pain, it induced a longer-term elevation in blood cortisol concentrations. Long-lasting analgesics given with castration are not advised. Further research is needed to evaluate alternative practical methods to reduce the pain caused by castration in piglets' on-farm.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

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