Using 'translactational analgesia' to reduce piglet pain at castration

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Background

Public concern regarding painful livestock procedures such as castration is increasing. Piglet castration has been criticized, largely because pain medication is not commonly used. The cost and labour required to administer analgesics to individual piglets are the main deterrents to producers adopting this practice. Having an affordable and practical method of delivering pain medication would likely increase the acceptance of this procedure and use of pain medication by producers. Previous studies with cattle have shown that analgesics can be transferred through milk at lactation. However, there is a lack of research on swine and the degree of passive transfer of these drugs to offspring. The objective of this study is to determine if the analgesic, Meloxicam©, can be delivered to the piglets via the sow. The study is being conducted in three parts, with the first objective being to determine if a) pain medication can be passed via the milk, and b) the drug concentration found in milk. The second objective is to determine the most effective time period that will provide the maximum transfer of drug to piglets, and the third objective is to determine whether this method is effective at reducing pain responses during or after castration.

Translactational Analgesia

Our first experiment studies the transfer and excretion of analgesic in milk. Twelve sows were injected with Meloxicam© at seven days post-farrowing, with each sow receiving one of three dosages. After the injection, multiple blood and milk samples were collected over a 5 hour period. The samples are currently being tested for drug concentration, and will indicate the amount of drug transferred through milk and how drug levels change over time. Based on these results we will determine an 'optimum' drug dosage and timing that may be effective at reducing pain at castration.

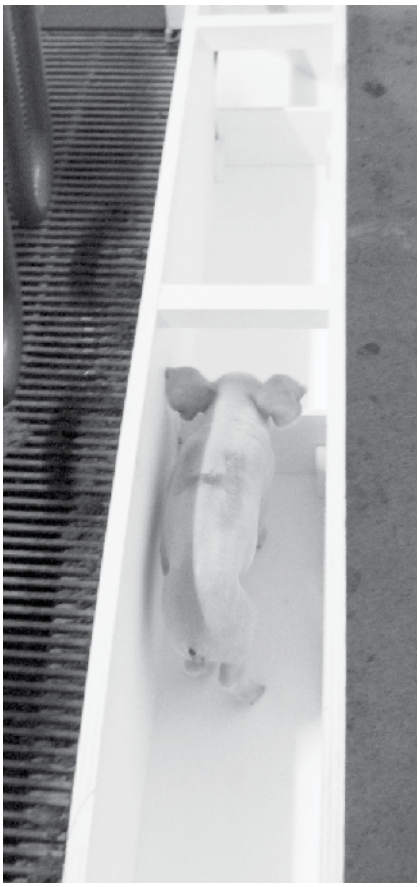

Figure 1. Piglet chute, used for behavioural observations after castration. The behaviour of pigs in the chute and time taken to return to the sow will be used to measure pain relief.

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In the second experiment, we will inject sows and collect blood samples from piglets to see if appropriate levels of analgesic are transferred to piglets. A third and final experiment will involve 24 sows and 144 piglets, and will assess whether translactational analgesia is effective at reducing pain. Some sows will receive the analgesic, and some a saline injection as a 'control' treatment. Piglets will be castrated one or two hours after sow injection, and using a variety of measures piglet pain will be assessed at the time of castration and for up to 24 hours following castration. Some piglets will not be castrated, but will receive a 'sham' treatment involving handling similar to that used for castration. This will help us to determine the difference between the actual pain of castration, and the piglet's reaction to handling.

Measures used to evaluate pain relief will include piglet vocalizations at the time of castration, and behaviour over a 24 hour period following castration (lying, standing, time spent suckling). Meloxicam© is a non-steroidal anti-inflammatory (NSAID) drug, similar to aspirin, and is expected to reduce pain and inflammation following castration but is not likely to have a noticeable effect on pain at the time of castration.

Previous studies have shown there is little difference in the behaviour of castrated and non-castrated piglets within the farrowing crate; piglets generally continue to feed and rest with their littermates following the procedure, with only minor changes in posture and movement. Therefore, as a method to identify pain, piglets will be observed manoeuvring a chute with hurdles (Figure 1) for indications of pain or discomfort approximately 20 minutes after castration. The piglet must raise its hind legs high in order to cross the hurdle, and therefore it is expected there will be differences in the length of time it takes a piglet to manoeuvre along the chute and over the hurdles if experiencing discomfort from castration. The piglet is placed in a wooden chute at the back of the farrowing crate, and must walk down the chute to return to the sow. To ensure that the piglets are familiar with the chute they will be trained on the day before by placing them in the chute and letting them learn how to find the exit.

The Bottom Line

With the growing awareness of animal welfare issues in the public, there in an increasing need for alternatives to painful procedures such as castration. Finding a practical and economic way of providing pain relief would enable producers to address this problem effectively, while also improving piglet welfare. Using translactational medication for pain relief would be much easier to implement compared to injecting individual piglets, and if it is shown to be effective could offer producers a way forward.

Acknowledgements

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(Just when we thought ..... cont'd from page 1)

- ADG in grow-finish pigs increased 33%
- Infrastructure for both production and processing has been largely replaced or renewed (especially in western Canada)

The next 20 years we can anticipate might be somewhat muted compared to the past 20, with fewer new barn openings perhaps, but just when you think you can predict the future something shifts and new possibilities emerge. Few if any of us could have predicted the 30 pig/sow/year barrier would be exceeded; so we are better off not predicting but developing a system that can respond as need and opportunity arises. That in essence is what swine research must never lose sight of. We must build, maintain and fund the scientific intellectual capability and facility capacity to ask the next questions which give us the next generation of answers to develop the questions that will be asked in 20 or 30 years.

At the time of writing this article I have recently had the opportunity to meet with several of the pork boards across Canada, most of the processors in Canada, participated in workshops on how we are to implement group housing for gestating sows, met with researchers, university and industry to work on creating a new business model for the future of swine research in North America, and witnessed the culmination of 4 years of health advances at the Canadian Swine Health Forum. Yes there is much angst concerning current profitability but there is still no question that there will be a future for pork production in Canada.

The Centre just completed an independent third-party review of its operations, stakeholders expectations, past deliverables and assessment of future role. The external review process was in-depth and in addition to an internal review and development of a report on the Centre's past accomplishments it included a two day site visit, personal interviews with staff & stakeholders, and communication with funding agencies and collaborators. A final report is expected in November and will be a public document of the University of Saskatchewan (available also at www.prairieswine.com).

We are sandwiched into this period in history where poor returns cast a shadow over everything we do. It is easy to fall into a malaise, and there is something we can do about it. No 'ifs and ands or buts' we at Prairie Swine Centre are given this time and we will make the most of it. A perfect example is the new 2011 Research Results you will find at www.prairieswine.com. There are 28 new scientifically sound conclusions we can make this year that did not exist prior to this time. Many of these have been analyzed for their impact on net income ranging from $0.50 to over $2.00 per pig. These can also be found on our website www.prairieswine.com

Thank you to all the pork producer, government and industry supporters who make our research possible.

> "swine research must never lose sight of what is needed to build, maintain and fund the scientific capacity to address the questions that will be asked in 20 or 30 years."