When Wounds Talk, Researchers Listen

By Geoff Geddes, for Swine Innovation Porc

If your lesions are talking to you, it may be time to swear off the wine. For pork researchers, though, the sobering truth is that carcass lesions can speak volumes about when and how the pig was injured. Paying attention to those lesions and the tale they tell could have real benefits for producers, their workers and their animals.

"Lesions are not only an animal welfare issue, but also an economic issue as they have an impact on carcass quality and thus the pork processor's revenue," said Dr. Luigi Faucitano, research scientist with Agriculture and Agri-Food Canada.

> BY NARROWING THE WINDOW OF WHEN LESIONS OCCURRED, THIS RESEARCH COULD BE THE FIRST STEP TOWARDS PREVENTING THEM IN THE FUTURE

Mixing it up

Lesions or bruises most often occur during the last 24 hours before slaughter, and usually result when unfamiliar pigs are mixed together. Apart from the welfare implications, a bruised carcass can be downgraded and lose value, up to 6 per cent in the case of severe bruising.

Lesions are commonly assessed for their severity by giving a subjective score based on their distribution on the carcass, number and type. However, no reliable technique exists for the determination of their time of infliction or age through the evaluation of lesion color. This study sought to address that problem by developing objective methods to determine the age of lesions on pork carcasses on the slaughter line.

"This was a really innovative research as nothing of this nature had been done on pigs before. We started from scratch and tried different approaches, even looking at techniques from forensic science like the ones used on CSI."

Showing their true colors

The method they settled on for judging lesion age involved color measurements carried out with a spectrophotometer. They then tested the accuracy of this approach by mixing pens of animals at four different times, which inevitably resulted in lesions due to fighting. Because they controlled when the mixing occurred, they knew when the lesions were inflicted.

"We found that the color measurement system was able to classify the lesions by age into one of two categories: less than seven hours old or more than 25 hours old. These results were validated by the expression of genes regulating the skin lesion healing process and histological analysis the branch of biology dealing with the study of tissues] detecting the inflammation response in the skin after a laceration. That was significant as we knew that the fresh lesions would have occurred at loading at the farm for transportation to slaughter and the older lesions were inflicted in the pen on farm."

By narrowing the window of when lesions occurred, this research could be the first step towards preventing such lesions in the future.

Lessons learned from lesions

"The value of this system is in the feedback it offers others on the production chain regarding the timing of injuries. If they happened during loading or at the plant, you know you have a problem with facilities or training there, and once the cause of the lesions can be traced back, the necessary adjustments can be made."

Healthier pigs, healthier profits

If those adjustments lead to less lesions going forward, they could save money for the whole pork chain by preserving carcass value while improving animal welfare in the process. Given these benefits, reaction to the project should come as no surprise.

"This is a big contribution to science and was valued as such by the editors of the Journal of Animal Science, where the article containing these results was published as-is, with no corrections or comments. We've had inquiries from scientists in France about our protocols and interest from a Quebec company in helping to bring the technology to industry once we've refined it."

While that refinement is a must for making the technique practical, this groundbreaking research could be the first step in turning sore spots into sources of knowledge.

So the next time your lesions start talking to you, it might be worth a listen.

For more information….

For more information about the work described in this article, please contact Dr. Luigi Faucitano at luigi.faucitano@agr.gc.ca.

This research was part a larger national project titled *Use of novel technologies to optimize pig performance, welfare and carcass value*.

You may find additional resources related to the project by consulting our website:

http://www.swineinnovationporc.ca/research-technology.php

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