



Pork Quality: How to Assess without the Mess

By Geoff Geddes, for Swine Innovation Porc

Assessing pork quality is like throwing a birthday party for your two-year-old: time consuming and messy. But as new technology is applied to many areas of production, researchers are seeking better, more efficient options for necessary tasks. That was the impetus for the project entitled *Application of rapid methods of non-invasive assessment of pork quality*.

“There’s a need today to develop technology that assesses meat quality in a non-invasive manner,” said Dr. Claude Gariépy, meat quality scientist with Agriculture and Agri-Food Canada (AAFC). “Currently they have to take a sample of the meat and run different chemical tests. If the means were available to predict quality without contact, it could reduce the cost and time involved while preserving the integrity of the cuts, and that would be huge for the industry.”

Two technologies - nuclear magnetic resonance (NMR) and hyperspectral imaging - have been assessed for this purpose.

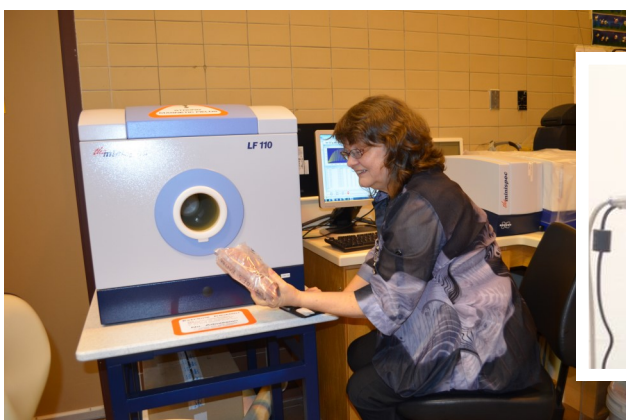
No such thing as too much information

“NMR technology is similar to MRI (magnetic resonance imaging), which most people are familiar with. The difference is that NMR gives you information on the entire sample rather than separate information on individual volume elements,” said Dr. Marie-Rose Van Calsteren, honorary scientist and NMR specialist with AAFC.

Though more study is needed, preliminary results show promising relationships with water holding capacity, including drip loss, cooking loss and meat color.

A system you can lean on

Another part of the project is looking at mechanisms for determining meat composition by examining water, lipid and protein content or the amount of lean meat and fat in the sample. For this approach, Van Calsteren said they’ve had very good results, especially for the lean/fat method.



NMR equipment (photo on left). Line scan hyperspectral imaging system (photo on right).
Photos: Canadian Centre for Swine Improvement

“We’re seeing strong correlations and a big time saving, where analysis that used to take days can now be done in 45 seconds. The implications for processing or slaughter plants are significant.”

As well, the power of NMR could be enhanced by a separate sub-project under Dr. Michael Ngadi at McGill University on hyperspectral imaging. Mimicking commercial conditions, researchers used the imaging to scan loin samples and determine the intramuscular fat content in both frozen and thawed pork loins.

“We’re going to compare the two approaches [NMR and hyperspectral imaging] to see if they might be complementary as far as what information they can provide.”

Fat tracking

On a third front, the project seeks to improve the measuring of fat consistency to accommodate changes in how pigs are raised.

“Because of genetics and new approaches to feed, carcasses are getting leaner and the fat is becoming less saturated and less firm,” said Gariépy. “This causes problems with processing equipment, especially for slicing bacon, and the softer fat tends to oxidize faster, reducing its shelf life with retailers. Being able to identify problematic bellies ahead of time can save a lot of trouble.”

Made to measure

In applying some of the technology from this project to a plant setting, the possibilities are numerous.

“This could allow the plant to measure a lot of samples in a short amount of time and direct the meat

or fat accordingly, depending on the market for which it’s best suited; for example, sending darker color cuts with more marbling to Japan,” said Gariépy.

Since intramuscular fat can’t be assessed visually, the ability to determine various components of meat composition with non-invasive techniques has great potential.

“At the moment, we are running regular tests with the NMR equipment, correlating a great deal of information in the signals with meat quality parameters. If plants can use that technology to test samples rather than sending them to an external lab, they could preserve that sample and still get value from it rather than sacrificing it for testing.”

They can’t help with your two-year-old’s party, but if researchers tap even part of the potential for this technology, they may give the industry something to celebrate.

For more information....

For more information about the work described in this article, please contact Dr. Claude Gariépy at claud.gariepy@agr.gc.ca or Dr. Marie-Rose Van Calsteren at marie-rose.vancalsteren@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>

Publication of this article has been made possible by Swine Innovation Porc within the Swine Cluster 2: Driving Results Through Innovation research program. Funding is provided by Agriculture and Agri-Food Canada’s AgriInnovation Program and by provincial producer organizations.