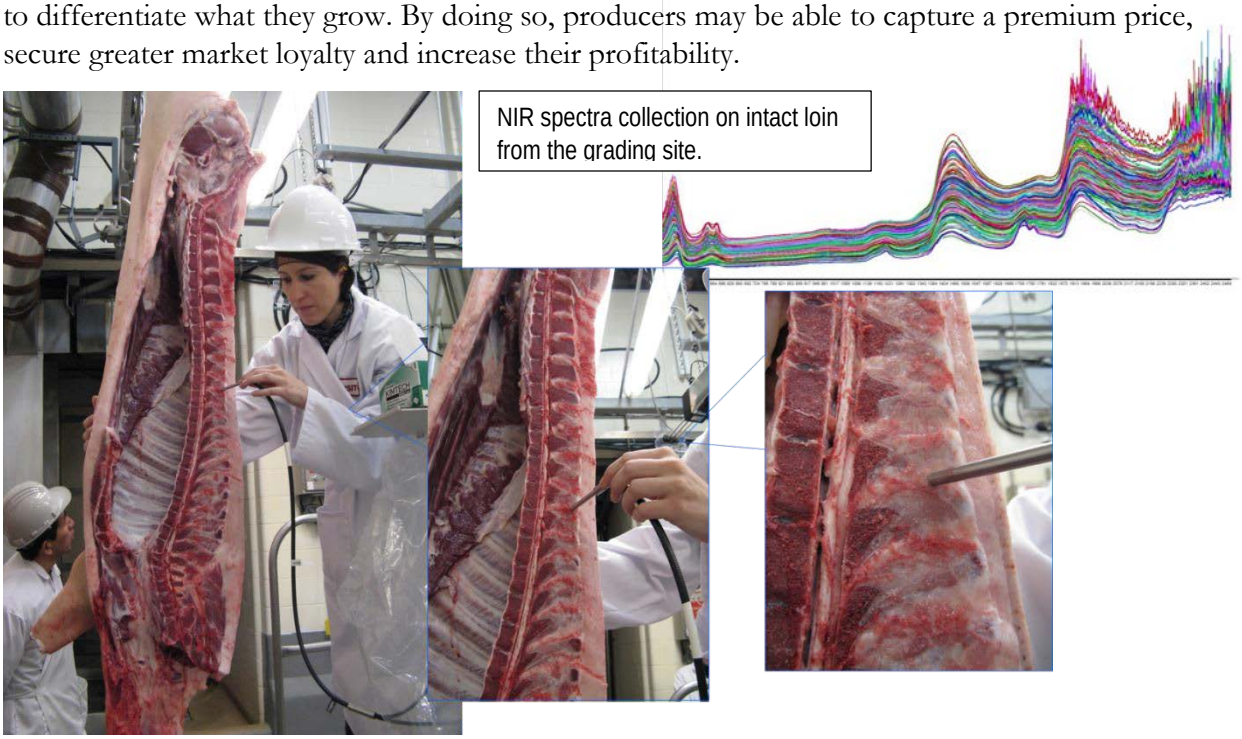
NIRS comes to the meat plant

by Kieran Brett

This technology is well-established for evaluating feedgrains. Two AAFC scientists, with funding from ACIDF and ALMA, have shown that NIRS can also assess carcass traits and meat quality.

Agricultural producers, long accustomed to taking the price the market offers, are looking for ways to differentiate what they grow. By doing so, producers may be able to capture a premium price, secure greater market loyalty and increase their profitability.



According to Jennifer Aalhus, different markets have distinct ideas about what they want and are willing to pay for. It's up to Alberta producers and processors to deliver.

"Everyone is looking for those points of differentiation," says Aalhus, Lacombe, Alta.-based

Meat Quality Scientist with Agriculture and Agri-Food Canada (AAFC). "In the case of pork, the Japanese market prefers a more highly marbled meat with a darker red color. Within Canada, other points of differentiation can also have value."

In recent years, swine feeding has experienced something of a revolution. Near InfraRed Spectroscopy (NIRS) technology now allows feed manufacturers and producers to quickly estimate the nutritional composition and feed value of grains. Even before feed is put out for the pigs, the producer has a good idea of how it will perform.

It turns out, feedgrain evaluation is just the start of how NIRS can help pork producers and processors. Since 2012, Aalhus and colleague Nuria Prieto – a published expert in this area -- have studied how to use NIRS to evaluate carcass traits. A worker at a processing plant could use a portable NIRS probe to estimate, for example, its degree of marbling or fat softness. More highly marbled carcasses could go in a differentiated product stream, earning producers and processors a better return. Fat softness is an important trait for further processing, particularly in bacon manufacturing.

This research was supported by the Alberta Crop Industry Development Fund (ACIDF), under the $8 million Feeding Initiative funded by the Alberta Livestock and Meat Agency (ALMA).

Wide variability aids equation work

The ability of an NIRS unit to rapidly estimate important values, such a nutritional composition of feedgrains or loin area of a swine carcass, can seem magical. Behind the scenes, however, it takes a great deal of scientific and technical work to make this happen. NIRS technology needs to be constantly calibrated, by comparing its predictions to physical results – wet chemistry for grain samples and detailed grading for carcasses. The resulting equations are the true magic of NIRS.

Aalhus and Prieto were fortunate that a large-scale, ALMA-funded swine carcass quality project was taking place at the same time. This gave them a large and diverse set of data to work with.

"We had a population of pigs arising from this project with high variability in terms of quality, including different breeds," says Prieto, "which allowed us to build the equations we needed."

A promising start

Based on their work, Aalhus and Prieto concluded that NIRS could accurately predict important qualities in swine carcasses. They emphasize that much work remains. Equations must be validated and operators will need to be trained to use the equipment and software.

While these AAFC researchers have shown the way, taking this idea further will depend on private-sector leadership and investment. AAFC is now in talks with a company that wants to develop and commercialize NIRS for carcass evaluation.

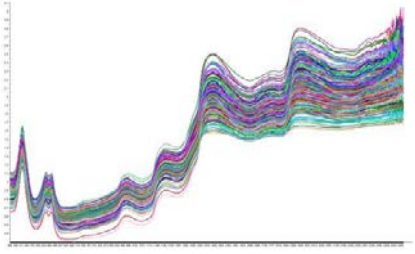
Today, consumers at home and abroad know more about their food than ever. When they perceive that a product has premium qualities – in marbling, color, taste or even production practices – they're willing to pay more.

This, according to scientists Jennifer Aalhus and Nuria Prieto, is what NIRS can do for pork producers and processors.

"The technology is getting better and better all the time," says Aalhus, "and we think we can implement it in a way that benefits the industry."

Photos supplied by AAFC

Collection of Vis-NIR spectra on intact chop.



ACIDF Alberta Crop Industry Development Fund Ltd.

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