Study puts hard numbers to benefits of NIRS

by Kieran Brett

A four-year economics research project, funded by ACIDF and ALMA, has produced evidence of feed cost savings of up to 10%.

It's easy enough to see how Near Infrared Spectroscopy (NIRS) technology should help Alberta livestock producers. By rapidly and accurately estimating the nutrient value of the feed, producers should be able to adjust their rations to maximize performance and minimize waste. They should be able to spend less on feed for each unit of gain.

That's a lot of *shoulds*. Given its cost, it's important for livestock producers to understand in detail how much NIRS will help their bottom line. That's when NIRS research moves from the discipline of livestock nutrition to the discipline of economics, and to the desk of University of Alberta Professor Scott Jeffrey.

"The area I work in is agricultural production economics," says Jeffrey (pictured above). "I'm interested in problems that relate to production management practices for all different kinds of farm businesses and the economics of those, as well as associated risk."

Comparison of feed costs, with and without NIRS

Beginning in 2011, Jeffrey led a research team on a four-year project to develop a benefit-cost analysis for the use of NIRS in Alberta. The project drew on the experience of the Alberta NIRS Network, a 15-member group that includes feedlots, other livestock producers, feed manufacturers, feed consultants, animal health consultants and the University of Alberta. This research was supported by the Alberta Crop Industry Development Fund (ACIDF) through the $8 million Feeding Initiative funded by the Alberta Livestock and Meat Agency (ALMA).

With Jeffrey serving as Prinicipal Investigator, the research team included Henry An and Jim Unterschultz from the University of Alberta, Mary Lou Swift of Hi-Pro Feeds (formerly of Alberta Agriculture) and graduate students.

The team studied the costs/benefits of NIRS within four livestock segments -- beef, dairy, hogs and poultry (broilers) -- by comparing the data of producers who are using NIRS with producers who aren't.

"By looking at these two scenarios for each livestock type, the nutrient requirements were the same for each animal," says Jeffrey. "We looked at the difference in cost without the NIRS information, then with NIRS. The benefits we identified with adopting the technology represented the difference in the ration cost that we were able to quantify."

NIRS economically viable across the board

Comparing costs to savings to estimate a benefit is a more complex exercise than you might think. One complication is that while the bulk of NIRS costs come up front – when you purchase an NIRS unit – its potential savings accrue over time and the value of those savings changes over this period. Jeffrey used economic models and statistical tools to arrive at a valid feed cost savings for each livestock type.

Will the introduction of NIRS technology allow Alberta's livestock industries to save on feed costs? This project produced a clear answer: *yes*.

The degree of the benefit created by NIRS, however, varied significantly from one livestock type to another. In the dairy group, feed cost savings ranged from 1.5% to well over 10%. At the high end of this range, a dairy producer with a 100-cow herd would save $13,000 per year by using NIRS.

According to this research, NIRS-related feed cost savings in hogs were 6.3% and were 3% in broilers. Savings in an operation backgrounding beef cattle ranged from 0.5% to 5.5%. Savings in a beef feedlot were up to 5%.

Even at the low end of these ranges, NIRS is a profitable proposition for livestock producers. At the higher end, with savings between 5% and 10% for hogs, dairy cattle and beef cattle, NIRS promises to be transformative.

"Given the nature of the technology and what it does, it makes sense that there should be benefits to livestock producers from adopting it," says Jeffrey. "The question was, would the magnitude of the benefits outweigh the cost of the technology?"

After four years of data gathering and analysis, a team of researchers led by Scott Jeffrey has taken NIRS beyond what it *should* do, and highlighted what it *will* do. For those who use NIRS, and those who've been unconvinced to this point, that's a big step forward.

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