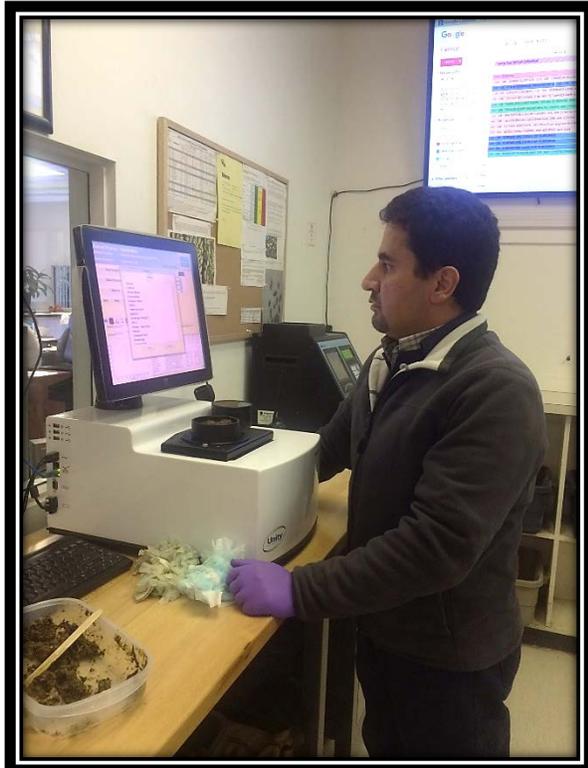


New NIRS application could save livestock producers millions

by Kieran Brett

With funding from ACIDF and ALMA, Kim Stanford has found a possible on-farm method by which livestock producers can estimate feed conversion.



Homayoun (Stanford main technician) using the NIRS machine

Over the last 10 years, Near Infrared Spectroscopy (NIRS) technology has transformed how livestock producers use and evaluate feed ingredients. For example, many feedlots use NIRS to estimate the chemical composition of the grains they purchase, to predict how well it will perform nutritionally with their cattle.

While using NIRS to manage what goes *into* the cattle is becoming well established, a new frontier has emerged at the *other* end: using the same technology to evaluate livestock feces to determine the amount of starch that is excreted.

Kim Stanford, a Researcher with Alberta Agriculture and Forestry, recently completed a project to explore how this could work. The Alberta Crop Industry Development Fund (ACIDF) provided funding for this research through the \$8 million Feeding Initiative funded by Alberta Livestock and Meat Agency (ALMA).

“One of the goals of this research was to give us the ability to predict feed conversion,” says

Stanford. “Measuring how much starch is present in the cattle’s feces ultimately indicates how well the cattle are digesting their feed. If a producer can process the grain better so cattle can more completely digest that starch, that owner should be able to buy substantially less feed.”

A game-changer for feedlots?

In Alberta’s multi-billion dollar cattle industry, even a percentage or two in feed conversion improvement is economically significant and more than worth pursuing.

In order for this to occur, however, the fecal material needs to be NIRS-ready. As Stanford explains, scanning a pile of fresh cattle feces with an NIRS machine won’t yield much useful information. The material is too wet, which leads to inaccurate readings. What’s the best way to dry this material? The research team didn’t have to look far.

“Our idea was to use microwave ovens to dry feces,” says Stanford, “since that’s something that could be easily done on-farm. Microwaves are cheap to buy, and it worked fine.”

Stanford and her team collected feces samples from cattle receiving finishing diets in feedlots across southern Alberta. The team eventually settled on a ‘recipe’ that would dry the samples down without damaging them. That turned out to be a 400-gram sample microwaved on ‘high’ for 15 minutes.

Big gains to be made

The team dried 94 feces samples and scanned them with NIRS. Of these, 60 samples were also given a full lab analysis to compare to the original NIRS scans. While the microwave process did a good job drying samples down, researchers found the amount of fecal starch was challenging to read, since the starch was not uniformly distributed in feces. Stanford is optimistic that the use of another simple tool – a small grinder, similar to a coffee grinder – is all that’s needed to allow feedlots to evaluate fecal matter accurately and assess feed conversion.

Stanford’s investigation showed starch levels in the feces samples of between 3% and 18%, with an average of about 10%. She believes that even small reductions in starch output would result in significant savings for producers. Some feedlot operators could gain marginally by changing how they process their grain, while others could achieve more dramatic gains in efficiency by doing the same.

“The commercial value of this technology was one of the more significant findings of the study,” says Stanford. “If feedlot producers could reduce the starch in the feces of their cattle by just one percent, which is completely doable, we predict the Alberta cattle feeding industry could save an estimated \$31 million per year.”

