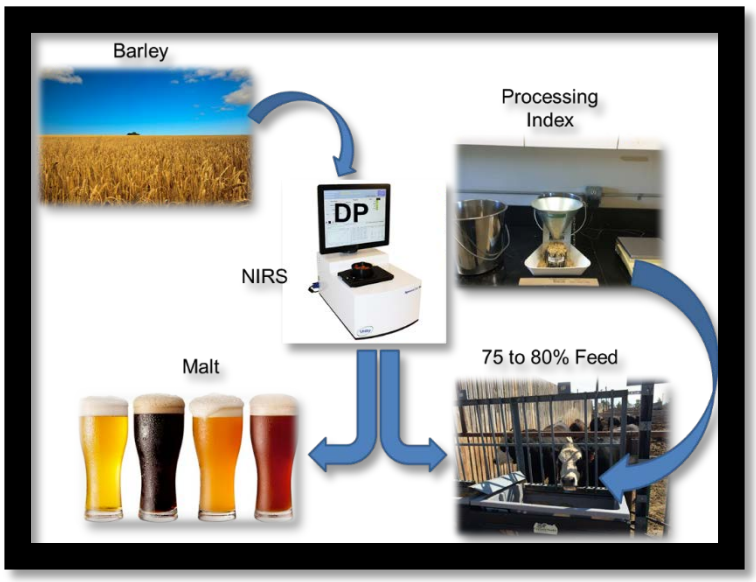
Using malt parameters to predict barley's feed value for cattle

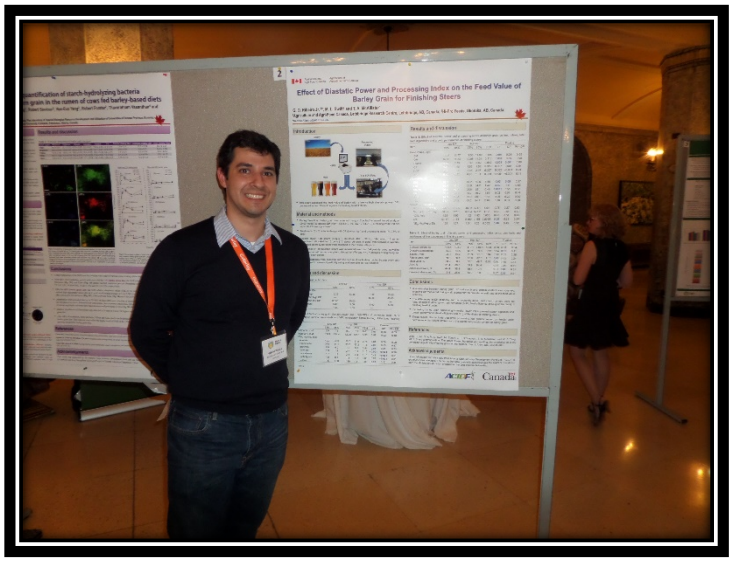
by Kieran Brett

Not all barley rejected as malt is equally good in a feedlot. In fact, with funding from ACIDF and ALMA, researchers Tim McAllister and Gabriel Ribeiro discovered how to save $5 per head on feed costs.



When malt barley goes for grading, the malt company will use the best tools available. Leading-edge Near Infrared Spectroscopy (NIRS) technology, and other methods, allow for the rapid assessment of no fewer than 14 characteristics needed to make good malt.

If a sample of barley is rejected for malt – and up to 80% of samples are – the barley could be sold to a feedlot. At this point, the barley might be priced based on more subjective values such as bushel weight and plumpness.

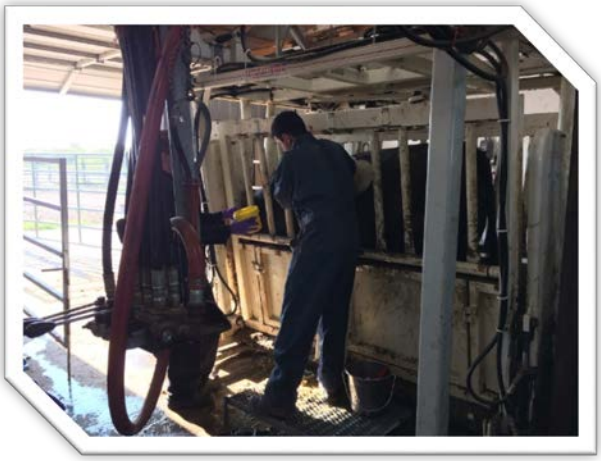


As scientists Tim McAllister and Gabriel Ribeiro (pictured left) compared the rigor of the maltster's assessment with the relative subjectivity of the feed value assessment, they wondered whether the maltster could help the feedlot operator. One of the 14 values measured by maltsters is diastatic power (DP).

"The level of diastatic power is a reflection of protein and starch in the barley," says McAllister, Principal Research Scientist, Ruminant Nutrition & Microbiology, with Agriculture and Agri-Food Canada in Lethbridge. "A good level of DP is good for malt, but it lowers the starch in the kernel. That's significant, because we feed barley primarily for energy."

Does the DP needed for malt reflect barley feed value and its impact on the performance of cattle? In 2014, McAllister and Ribeiro began a one-year study to answer this question. The work 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).

Starch drives performance, protein still adequate



For the purpose of this research, McAllister and his team sourced two lots of barley with wide variation in terms of DP and conducted two cattle-feeding trials. The level of DP in the barley was one variable; another was the degree of mechanical processing. The work confirmed, for the first time, the relationship between DP and growth performance in cattle.

"We found that the advantage of lower DP is higher starch," says Ribeiro. "Even though the lower-DP barley was lower in protein, it was still 11.5%, which is okay for cattle. The barley with lower DP fully meets the protein requirements of finishing feedlot cattle, and the extra starch is good for performance and growth."

Overall, lower-DP barley was found to have 3.2% higher total diet digestibility. If the grain was more intensively processed, the payoff was even greater. Feed efficiency was 4.5% higher and net energy gain increased by more than 5%.

More energy for cattle, higher price for grower

In Alberta's multi-billion-dollar cattle feeding industry, these findings represent a significant potential gain. By McAllister's reckoning, if barley with lower DP could be quickly identified, correctly processed and directed to feedlots, the industry could save $5 per head. This translates into $12.5 million in savings for cattle feeders, and there's plenty in it for barley growers, too.

"The feedlot operator could pay *more* for lower-DP barley and pay *less* for higher DP," says McAllister. "The grower with lower-DP barley could charge more for it."

Malt companies need to get a reading on diastatic power to make their barley selections. As McAllister sees it, if DP data was shared with sellers and buyers of feed barley, it could unlock significant value for both. More intensive processing would help, too.

"Something like bushel weight or plumpness is a bit of an abstract idea," says McAllister. "Diastatic power relates to starch and protein, so it's another tool to use in the assessment of the feed value of barley."

ACIDF Alberta Crop Industry Development Fund Ltd.

ALMA Alberta Livestock and Meat Agency Ltd.