

High Hopes for High Moisture Grain Treatment

By Geoff Geddes, for Swine Innovation Porc

Like adolescence, good science is about questioning everything: Why? How? What if...? A prime example is the project *Low cost post-weaning nutritional strategies - Pre-treatment of feed ingredients to enhance value* (D. Beaulieu, A. Van Kessel).

The research involves a series of experiments to establish the impact of acidifying high moisture cereal grains on pig nutrition, health and performance. While researchers don't yet have all the answers, asking the right questions is half the battle.

"Feeding trials with nursery piglets have demonstrated that formulating post-weaning diets using acidified grains at a low moisture content, particularly with wheat, improved feed intake and growth performance, primarily through improved gut health and nutrient digestibility," said Dr. Denise Beaulieu, Assistant Professor, Monogastric Nutrition, Department of Animal and Poultry Science, College of Agriculture and BioResources at the University of Saskatchewan.

Looking high and low for answers

"The question is whether we can get those same benefits when we use acidification to preserve high moisture grains, and whether the advantages are comparable to adding acids at the time of feeding."

Preliminary results show that while feeding acid-preserved wheat to newly weaned piglets doesn't have a dramatic effect on performance, it does improve feed efficiency. This improvement is comparable to the advantages gained with direct acidification of



Inoculation of high moisture cereal grain with two types of lactic acid. Source: University of Manitoba

diets. As well, researchers are examining the impact of acidification on different markers of gut health.

"We want to see if acid-preserved wheat could be beneficial for pigs who are in a more challenging environment or encountering minor health issues."

Grinding out results

In keeping with their questioning approach, project members are also looking at the inter-



action of acidification and particle size.

“Our premise here is that acidification of wheat or barley may be acting in a similar way as grinding grain coarse, resulting in longer retention time in the stomach that promotes growth of lactic acid bacteria and reduces pH due to fermentation products. This could represent an added benefit for producers.”

Preserve and protect

Apart from assessing the effects of acidification, researchers compared the grain preservation ability of different acids to explore options for industry. As is often the case with exploration, there was good news and bad news.

“When we preserved the grain we put different types of metal coupons in the grain samples to assess the degree of corrosion. Although there were good results using pure propionic acid versus a mixture of acids typically sold as a grain preservative, as expected, the former caused a lot of corrosion.

As a result, Dr. Beaulieu and her colleagues would not suggest using pure propionic acid commercially since its corrosive effects would be too hard on equipment. It’s an area they plan to explore further in consultation with engineers to develop protocols that will reduce corrosion of bins used to store the acid-preserved grains.

Though there is still much to be answered, every question gets researchers one step closer to new knowledge that can benefit pigs, producers and the industry at large.



Masters student Bonjin Koo working with piglets. Source: University of Manitoba



Once the grains were acidified, they were stored in barrels . Source: University of Manitoba

