



Research on Soybean Meal Offers Food for Thought

By Geoff Geddes, for Swine Innovation Porc

Is boosting income or cutting costs the key to success? In pork production, it's like choosing between food and water for survival: they're both kind of important. Since the revenue side depends on market forces that are largely beyond your control, trimming expenses is a focal point for science and industry. Given that feed represents the greatest cost, it is often the target of research, and that was the case in a recent project on fermentation of soybean meal.

"Soybean meal is produced from the residue left after oil extraction," said Dr. Julang Li, Professor in the Department of Animal Biosciences at the University of Guelph. "It is a balanced, high quality protein source for animal production that is cheaper than some alternatives like fish meal. Being plant based, soybean meal is also preferable to animal protein sources such as blood plasma that carry a risk for spreading pathogens."

Allergen issue is nothing to sneeze at

In spite of the advantages, the application of soybean meal poses some challenges. It contains allergens that can lead to intestinal upset when fed to young animals, so it can't be used in large quantities to replace animal-sourced protein. As well, some animals lack the proper enzyme (a protein that breaks other things down) to digest soybean meal.

These limitations prompted Dr. Li and her team to consider fermentation, which is the use of microbials like bacteria to help break down large components of soybean meal and improve nutrient digestibility.

"The fermentation approach has been used for many years in food processing of pickles and tofu, especially in Asia. There is a Korean/US company now with a good fermentation system for soybean meal, but we already have high quality meal in Canada. We just need to develop our own fermentation system to treat soybean meal at home."

With that in mind, Dr. Li's group has screened a lot of material and identified some that has

Advances in fermented soybean meal shows great potential for soybean meal to be more user-friendly for the intestine and easier for animals to digest

excellent enzyme activity. In the process, they have enhanced their fermentation system and are able to break down allergens and large proteins in soybean meal. The end result is meal which is more user-friendly for the intestine and easier for animals to digest and utilize. Their process also decreases the percentage of fiber in soybean meal and increase the crude protein ratio, both of which are beneficial effects for the animal.

As an added benefit, they have automated the fermentation system so it requires less energy and money.

Though they've come a long way, scientists hope to go farther.

Don't quit while you're ahead

"We want to continue with this study and make fermentation more cost effective. We're proposing some animal trials to confirm that fermentation of soybean meal is beneficial to animal production."

As well, stage two of this research would explore their finding that fermented soybean meal acts as a source of probiotic, which are microorganisms that provide health benefits when consumed by pigs.

"Many of the systems on the market to grow probiotics are expensive, whereas soybean meal is around \$0.50/kg, so it could be a more cost effective approach. The bacterium we isolated grows so much faster than the probiotics that are commercially available and is

more resistant to heat; consequently, it will survive even if exposed to high temperatures in processing."

"Because this fermentation system reduces or eliminates the allergic reaction in young animals, producers can include large amounts of soybean meal in their feed for young pigs as a protein source and benefit from the much lower cost compared to fish meal. Equally important is that you essentially kill two birds with one stone through this process, giving animals a better protein source and a valuable probiotic at the same time."

If this approach can leave animals better nourished, feed more affordable and producers more equipped to feed the world, it's hard to see a downside. 😊

For more information....

You may contact Dr. Julang Li, University of Guelph at jili@uoguelph.ca if you would like to learn more about the work described in this article.

More details about the project *Reducing feed cost and the environmental footprint and enhancing global competitiveness of Canadian pork production by increased nutrient utilization of feedstuffs fed to growing-finishing pigs* may be found on our website at:

www.swineinnovationporc.ca/animal-nutrition