



## Feed Research Has Finger on the Pulses

By Geoff Geddes, for Swine Innovation Porc

Just as a pulse is pretty important for humans, pulse grains can play a role in keeping your business alive and kicking. As feed prices continue to rise, the pork industry seeks new and creative ways to cut costs without cutting quality. That effort prompted a closer look at pulses as an option for feed ingredients.

Though farmers usually grow pulse crops like field peas, faba beans and lentils for human consumption, they sometimes become available at a reasonable cost for animal feed due to an export market collapse or downgrade in quality. Since less is known about some key aspects of pulses compared to other crops, research set out to change that.

“This project came about because, in spite of the array of pulse grains available in Western Canada, we don’t have enough information on their nutritional value and potential inclusion rate in swine diets,” said Dr. Ruurd Zijlstra, Professor and Chair in the Department of Agricultural, Food and Nutritional Science at the University of Alberta.

### Energy crisis

A key focus of the research was characterizing the digestibility of nutrients in pulse grains. While pulses have significant amounts of starch and protein, the starch in pulses has a different composition than starch in cereals. As a result, starch from



*Can pulses be a viable alternative feed ingredient for pigs? Photo: Keith Weller, Agricultural Research Service, USDA, 2013*

pulses is not well and quickly digested in the small intestine of pigs. Though it provides energy, it does so at a slower rate, and this difference requires clarification.

“If you just look at the total amount of starch in the diet, you can overestimate the amount of energy provided by pulse grains. We formulate swine feed to optimize the ratio of energy to amino acids, so if the energy level is incorrect, that ratio will also be

wrong, and we need to get it right. It's vital to predict net energy accurately when creating diets to maximize the nutritional value for your pigs."

### Picking the proper pulse

Researchers found that not all pulse grains perform the same when it comes to starch digestion; for example, field peas rate better in that regard than faba beans.

As that's not something normally seen in pig nutrient tables, it's added information for producers in making critical feed choices.

To further analyze digestion, laser scanning was adopted for production of 3-D images of the digestive structure. The results, which included a finding that application of heat and steam could boost starch digestion, will lay the groundwork for future research. In the meantime, though, this project could have implications for current practices in diet formulation.

### Staying flexible

"The outcome of our work fits a pattern of research showing that overall, we are underestimating how flexible pigs can be in the diets they are willing to consume. They are far more flexible than we thought 10 or 20 years ago. The more we can have pigs consuming ingredients that don't reach human feed markets and convert those ingredients into a high quality

animal protein like pork, the better off we'll be as an industry and a society."

On the subject of inclusion levels, Dr. Zijlstra and his team gleaned more information that could pique producer interest.

"We use pulse grains in phase three nursery diets soon after weaning. It's amazing how much soybean meal you could remove from these diets and still end up with good pig growth by upping the pulse level. When soybean meal increases in price, as it's bound to do, and pulse grains are available at a decent cost, they are a practical alternative ingredient to consider."

By getting the full picture of what to use and how to use it, research can help producers reap the maximum benefits from pulse grains without missing a beat.

#### Learn more...

For more information about the work described in this article, please contact Dr. Ruurd Zijlstra at [ruurd.zijlstra@ualberta.ca](mailto:ruurd.zijlstra@ualberta.ca).

This research was part a larger national project titled *Feeding programs for growing - finishing pigs to enhance global competitiveness: opportunities across Canada*.

You may find additional resources related to the project by consulting our website:

[www.swineinnovationporc.ca/animal-nutrition](http://www.swineinnovationporc.ca/animal-nutrition)

The work presented in this article was part of Swine Innovation Porc's Swine Cluster 2: Driving Results Through Innovation research program. Funding was provided by Agriculture and Agri-Food Canada's AgriInnovation Program, provincial producer organizations and industry partners.

