



Low vs. High Crude Protein Diets in Finishing Pigs

Pigs need to consume protein in order to create muscle and lean yield for which producers get paid. Dietary protein needs are directly proportional to the pigs lean deposition rate; and since we've selected for leaner and faster growing pigs their daily protein needs have gone up. We can't finish today's pigs on yesterday's diets very well. It's a bit simplistic to talk about protein content because it's only as good as the amino acid profile it contains. Pigs need amino acids to make muscle, and not all protein sources have the right mixture of amino acids. To compensate for shortages in some amino acids we have tended to overfeed overall protein content to avoid a shortage of specific amino acids.

Overfeeding protein works when feed is cheap or pig prices are high but unused protein does have consequences above just feed cost. Excess protein is digested by the body and eliminated mostly in the form of ammonia. Ammonia is an important contributor to air pollution both inside and outside the barn.

At the Atlantic Swine Research Partnership Research Barn we did a quick pilot study where we fed two diets both formulated to meet the protein needs of finishing pigs - one was a conventional diet, the second used synthetic amino acids to minimize the amount of crude protein, but not limit any amino acids. We fed the diets from 72 kg to market weight and measured the animal performance and carcass composition. The results are outlined below:

Diet Specifications	(70 kg to market)
Assumed Growth Rate	0.904 kg/d
Assumed Feed Intake	2.75 kg/d
Assumed Feed:Gain	3.03 kg/d
DE	3420 kcal/kg
T Lysine	0.83 %
D Lysine	0.73 %
T Lysine : DE	2.43 g/Mcal
Added Salt	0.35 %

Results	Low Crude Protein	High Crude Protein
Protein Content	12%	17%
Cost (Dec 2004)	\$236.00	\$233.60
N	23	23
Start weight	72.9 kg	72.7 kg
End weight	116.8 kg	113.9 kg
ADG	0.891 kg/d	0.835 kg/d
ADFI	2.13kg/d	2.08kg/d
Feed Conversion	2.79	2.94
Lean Yield	60.31 mm	60.16 mm
Backfat	19.36 mm	19.50 mm
Loin depth	61.56 mm	59.92 mm

The results show, that although the numbers in this pilot study are low, the pigs on the low protein diets performed as well or better than the conventional diets while the diet costs may not be very different.

Daniel Hurnik and Rick Hoeg
Atlantic Swine Research Partnership

Comments from the Research Chair

Feeding Strategies to Increase the Omega-3 Fatty Acid Content of Pork Using Linogen™ PS

A study was performed to evaluate an additive rich in omega-3 fatty acids to determine if it can raise the levels of omega-3 fatty acids in pork without adversely affecting the taste and quality attributes of pork.

Background

The response of pig adipose tissue to dietary fatty acids is dependent upon the fatty acid profile of the diet. Dietary levels of essential fatty acids will have a large effect on the levels of the corresponding fatty acids in adipose tissue, since the dietary fatty acids replace the de novo synthesis of other fatty acids. This is particularly true for the essential fatty acids linoleic and linolenic acid. For example, one researcher fed pigs diets containing either 5 percent tallow or 5 percent soya oil to produce diets with large differences in fatty acid profile. The adipose tissue composition of the pigs was affected by diet resulting in significantly higher levels of linoleic and linolenic acid in the adipose tissue of pigs fed the soya oil diet.

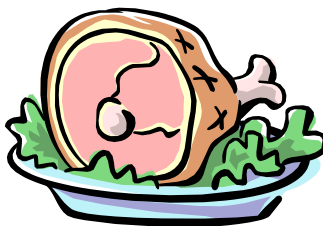
An opportunity exists to feed pigs a supplement high in omega-3 fatty acids and have that fat profile in pork products. A flax-based supplement, Linogen™ PS, was fed in an attempt to determine if it will increase the omega-3 fatty acid content of pork.

Materials and Methods

The project was conducted at the ASRP research facility on Union Road, PEI and involved the use of 25 pigs in 1 pen. The pen received the following diet for 30 days prior to slaughter. Linogen™ PS was supplied by Natunola Health, Ottawa, Ontario. The pigs received a conventional commercial diet in their previous growth phases.

Coarse Crush Barley	585 kg
Coarse Crush Corn	250 kg
Soybean meal 48%	100 kg
Linogen™ PS	25 kg
Vitamin mineral premix	40 kg

A sample of pork was taken from each of the four primal cuts (picnic, belly, boneless loin, and ham) and a fatty acid profile was generated by Maxxam Analytics, Mississauga, Ontario. The cuts were trimmed to retail specifications and samples were sent for fatty acid profile. Pork was distributed to a food scientist for an informal sensory analysis.



Results

The pork had increased levels of omega-3 fatty acids in the pork in a ratio proportional to the fat content of the primal cut.

Only the belly had levels that could carry an omega-3 claim under current Canadian labeling regulations.

There were no problems with pigs eating the supplemented diets and all pigs were marketed normally.

There were no negative attributes to the pork, and it was thought to be suitable for retail markets.

Implications

There were no adverse effects associated with feeding Linogen™ PS to pigs in this study. The pigs ate the diet well. Since this was a pilot study, with no control diets included, no quantitative animal performance data was generated but animals were marketed normally at slaughter weight.

The omega-3 content of the pork increased in proportion to the fat content of the cut of pork. At the level fed in this trial, an omega-3 claim would only be possible in one of the primal cuts. At the present time a label claim is allowed if greater than 0.3 g of omega-3 fatty acid is present in a 100 g portion. Only one of the primal cuts exceeded this level because of the higher fat content of this cut. A higher inclusion rate of Linogen™ PS would be required to increase the omega-3 content of the other pork cuts. At this time, a preliminary estimate would suggest that a higher amount of Linogen™ PS or a longer feeding time may be needed to increase the content of omega-3 in the leaner cuts.

Informal sensory analysis indicated no adverse flavours or problems with acceptability of the pork.

Further Research Ongoing

A more detailed matrix study is needed to determine optimal feeding level. To address this need, a follow-up study is currently underway to look at different rates of the additive Linogen™ PS rich in omega fatty acids to determine if they can raise the levels of omega fatty acids in pork without adversely affecting the taste and quality attributes of pork, and to determine the content of omega-3 in the primal cuts from these pigs.

Daniel Hurnik (Hurnik@upei.ca)

A handwritten signature in black ink, appearing to be 'DH' or similar initials.

Summary of USDA Hogs and Pigs Report

Excerpts from Glenn Grimes and Ron Plain

<http://agebb.missouri.edu/mkt/bull8c.htm>

December 28, 2006

- The December Hogs and Pigs Report came in very close to trade estimates and our expectations. The total number of hogs on farms December 1 was up 1.1% from a year earlier, the same as the average of the trade estimates. The USDA estimate for the breeding herd was up 1.3%. The trade estimate was for the breeding herd to be up 1%.
- Good news is that the demand for pork at the consumer level during September-November was flat with a year earlier. Also good news is that the demand for live hogs for January-November was up slightly from the same months in 2005. The stronger live hog demand than consumer demand was due in part to larger pork exports.
- Total pork imports for January-October were down 1.6% compared to this period of 2005, but live hog imports from Canada were up 7.2%. Feeder pig imports were up 12.2% but slaughter hog imports were down 2.4% compared to last year. We expect feeder pig imports from Canada to continue to increase.
- Higher corn prices are contributing to some lighter hog weights. The weekly average weight of barrows and gilts in Iowa-Minnesota has been below a year earlier for the last 13 weeks.
- If corn prices for 2007 are as high as now seems likely, the cost of producing hogs will be between \$50 and \$51 per cwt. based on the Iowa State University price series. If our price forecast is close to right, the average-cost producer is likely to lose money for the year.
- Based on the Iowa data, the average-cost producer had enjoyed 34 consecutive months of profit at the end of November. At the end of December the consecutive months of profit were probably pushed up to 35. We will need a good winter price rally or these profits are likely to come to an end in the first quarter of 2007.
- One wild card as to 2007 slaughter levels compared to 2006 is the disease circovirus. Will the more readily available vaccines for this disease reduce death loss enough to show larger marketings than we have estimated? With the current very inelastic demand for hogs, a 1% increase in slaughter due to less death loss would likely be negative to hog prices by about 5%.
- Unless demand for hogs grows in the next couple of years, which is unlikely in our opinion, the hog industry will need to downsize some to cover the anticipated higher feed costs.
- More than likely, the largest problem hog producers will face in the next couple of years is how to live with high priced corn.

For further details, the full report is available on the United States Department of Agriculture (USDA) website at: <http://usda.mannlib.cornell.edu/MannUsda/viewDocumentInfo.do?documentID=1086>.

ASRP Staff Profile

Barb Enman was raised on a hog/dairy/beef farm in Truro, N.S. She studied at N.S.A.C. and then Macdonald College on the path to obtaining a B.Sc.(Agr.) from McGill. Barb worked with the PEI Department of Environment for a number of years on environmental projects, including field assessments/monitoring and laboratory analysis, before deciding to leave the workforce to care for her children. During this time she started a small beef operation, backgrounding cattle and more recently cow/calf.

Barb started with ASRP in May of 2004 and is now Swine Technologist. In her role, she wears many hats. She manages the ASRP Research Barn in Harrington (pictured at right) where many of the ASRP research trials you read about in this newsletter are conducted. She serves as the CQA Coordinator for PEI Pork, managing this national program for PEI Producers. She also works on the Animal Productivity and Health Information Network (APHIN) at Natural and Organic Food Group Inc. APHIN is a computer-based, information network used to provide slaughter and health data to producers to aid in benchmarking productivity and herd health.



Barb has always had an interest in agriculture and enjoys interacting with the agricultural community. She has two children who now live off Island and are working/studying in their chosen fields.

Have You Surfed the ASRP Website Lately?

The web address (URL) is the same but the ASRP website recently underwent a transformation!

With the expertise of the Information Technology in Education Centre (ITEC) at UPEI, we now have a new and improved presence on the world wide web. Take a look at: <http://www.asrp.ca>.

Here's a sneak peek at our new home page.



Check out the new site and let us know what you think. We would love to hear from you.

Happy surfing!



ATLANTIC SWINE RESEARCH PARTNERSHIP INC.

Atlantic Veterinary College
University of Prince Edward Island
550 University Avenue
Charlottetown, PEI
C1A 4P3

Phone: 902-566-0963
Fax: 902-894-2861
E-mail: newsletter@asrp.ca

Putting research into practice.

Want more information?

<http://www.asrp.ca>

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Our mission is to empower Maritime swine producers to participate in the research and innovation needed to face present and future challenges. Our key research priorities are:

- Reducing cost of production
- Nutrition with a key emphasis on reducing feed cost
- Herd health
- Environmental management