



ANIMAL INDUSTRY

Manitoba Swine Update

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Amino Acid Formulating

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Thirty years ago, crude protein was the most common measure of the value of a ration. At that time, an emerging area of research focused on amino acids, the building blocks of protein. Measuring amino acid levels gave us a means to compare individual ingredients to the needs of the pig.

Amino acids have been segregated into essential and non-essential groups. Lysine, threonine, methionine and cystine are familiar from the essential group of the amino acids most likely to need attention when balancing rations. Occasionally, tryptophan can be of concern.

Amino acids are further arranged according to ideal ratios that are age- or production-specific to make the most of uptake and utilization.

For the pig, ideal protein rates use Lysine as the base amino acid and assign it a value of 100. All other amino acids are relative to Lysine.

The value of an ingredient or ration is best determined by the digestibility for the animal. Each ingredient has a unique set of amino acids, along with other substances, that it contributes to the ration. Some substances are not helpful and are called anti-nutritive substances (ANS). These ANS can interfere with the digestion of the amino acids and, therefore, reduce the value of the ingredient for ration formulation.

Anti-nutritive substances can function in a number of ways to reduce amino acid availability or uptake by the animal. Proteins are long chains of amino acids. Once ingested they are subjected to acid and enzyme attack that split the protein into individual amino acids or short chains of two or three amino acids called peptides. Enzymes split protein at specific junctions. Some ANS will block these junctions preventing proper digestion and reducing the value of the ingredient in a feedstuff. Heat treatment will often deactivate ANS substantially.

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Analysis Important for Quality Control

By: Mike Yacentiuk
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Errors in manufacturing feed have an economic impact on the profitability of a swine operation. Quality control of swine rations entails the use of quality ingredients and the proper formulation, preparation, storage and analysis of feed.

1) Quality Ingredients

The manufacture of high quality feed requires the use of high quality ingredients. All incoming ingredients should be examined for mould, debris and insect damage. The presence of mould does not necessarily mean that mycotoxins are present. Suspect feeds can be tested for mycotoxins at most analytical laboratories.

Nutrient analysis of grains and protein ingredients should include moisture and protein tests. If analysis of a guaranteed feed ingredient reveals a discrepancy when compared to the label guarantee, the supplier should be contacted to discuss the deviation.

Proper sampling technique must be used to obtain meaningful laboratory test results. Numerous samples should be taken at random intervals from flowing grain. If sampling is to be conducted from a bin or a truck, then a grain probe should be used to gather numerous samples. The randomly gathered samples are placed in a container and thoroughly mixed. A sub-sample of product is then sent to the laboratory for analysis.

2) Ration Formulation

A recipe should be used for each mixed ration, based on ingredient analysis and class of pig for which the ration has been designed. Opportunity feed ingredients, such as off-grade seeds, processing by-products or sprouted grain, are also good choices. These ingredients are relatively inexpensive, safe and can make a very good feed when the ingredient composition is known and the ration is properly formulated.

3) Feed Preparation

Ideally feed should be mixed by weight. When vertical PTO mixers are used without an attached scale, the batch should be periodically weighed after mixing. Variation in type and bulk density of ingredients may lead to some unexpected results in the final weight of the mixed feed. This exercise may entail loading the feed onto a truck and obtaining a weight from a local scale.

If feed is mixed with an electric proportioner, the proportioning and grinding equipment must be in good working order. The mill should be recalibrated on a regular

schedule based on volume or changes in feed ingredients. For the most common ingredients used in Manitoba, a screen size of 3/16-inch or smaller is recommended. The target particle size of the finished feed is 700 - 800 microns.

4) Storage

Feed should be stored in a clean and dry location and protected from insect and rodent damage. As they become empty, storage bins and the auger boots should be inspected for any mouldy feed and cleaned as needed. Proper safety precautions are required in confined spaces.

5) Feed Analysis

Due to the possible separation of ingredients in the feed delivery system, the ration needs to be sampled as close to the source of mixing as possible, using correct sampling techniques as discussed previously. Nutrient analysis of the mixed rations will consist of moisture, protein, calcium and phosphorous.

As feed represents approximately 60 per cent of a farrow/finish farm's total cost of production, it is prudent for producers to pay attention to all of the quality control aspects of on-farm feed manufacturing. For more information regarding on-farm feed manufacturing of quality swine feeds, contact your nearest Manitoba Agriculture and Food swine specialist.

Do Newborn Piglets Need Water?

By: *Brian Cotton,
MAF, Brandon*

It is usually assumed that a piglet on an all-milk diet has no need for additional fluid, except to increase effective use of creep feed just prior to weaning.

This assumption is probably true for healthy, fast-growing piglets receiving abundant milk from the sow. However, mastitis, hormonal imbalances or other problems may reduce milk supply. Piglets that are small or weak at birth from otherwise healthy litters may lose weight and die in the first days after farrowing. It isn't known whether very young piglets have the developmental maturity to correct dehydration by drinking supplementary water.

The Animal Research Centre in Ottawa has conducted a study on the consumption of drinking water by very young

piglets in 51 litters.

The study used bowl-type water dispensers to measure water intake.

In this study, some litters gained 200 g or more per piglet per day, after farrowing. Others lost weight the first days, then began to gain appreciable amounts on days three and four. The early weight gain patterns are largely attributed to initial lactation problems experienced by some sows.

Litters with low-weight gains tended to drink more water, especially the second day. The nine litters with the lowest gains on days one and two used more than 50 g/day of water per piglet the second day. The three litters that lost weight the first days used more than 100 g the second day. These piglets reduced their water intake as the sow's milk supply

improved. The high intake the second day was likely in response to low fluid intake.

Well-heated, modern facilities may help prevent chilling and hypoglycemia in poorly nourished pigs. However, the greater warmth may increase water loss and risk of dehydration in these piglets, in piglets with diarrhea or in those with trouble competing for milk.

The study concluded that at least some piglets have the developmental maturity to reduce dehydration by drinking water. If so, giving piglets access to water from birth may help reduce piglet death from dehydration under warm conditions.

Clean, fresh water and accessible water bowls are necessary in the creep area, if water is to be used.



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Too much heat could damage the protein, so great care must be taken during this process.

Digestibility was determined initially by measuring disappearance of amino acids. Those amino acids not present in the manure but present in the ration were presumed absorbed by the animal. Further research showed a more complicated process. Amino acid absorption is complete by the end of the small intestine. This part of the digestive system is called the ileum, and extensive research has produced a set of ileal digestibilities for most common feed ingredients. In the last 10

years, these ileal digestibilities have been improved to account for the loss of body protein for which there was no previous accounting. It is now common to use standardized ileal digestibility coefficients of amino acids to formulate rations. This has added to formulation accuracy and improved pig performance.

If your rations have not been evaluated for a number of years, take time to talk to a nutritionist who can give you some insight into where you might benefit. You may be giving up performance if you are using older formulations.

Hog Days Supports the Pork Industry

By: *Brian Cotton
MAF Brandon*

Brandon's Hog Days Committee supports the Manitoba hog industry and agriculture by contributing some of its small yearly surpluses to help fund research projects at the University of Manitoba.

Dr. Jim House is currently working on research to remove vomitoxin from locally grown feed grain, then using the grain in swine feeding trials. A number of researchers are

investigating methods to remove vomitoxin physically or chemically from cereal grains. The small trial work has progressed to the point where larger trials are now needed.

Dr. Martin Nyachoti is investigating the digestibility of alternative feed stuffs, specifically cull beans, for use in pig diets.

The Brandon committee has provided student bursaries of \$1000 per year for five years to a returning student of agriculture at both Assiniboine Community College in Brandon and the University of Manitoba. These bursaries are based on the academics and financial

Upcoming Events

Mark your calendar for the following events:

Hog and Poultry Days are scheduled for December 4 and 5 at the Winnipeg Convention Centre. For more information, contact Dr. Ian Seddon at 204-945-0353 or e-mail iseddon@gov.mb.ca.

The *Manitoba Swine Seminar* is scheduled for January 29 and 30 at the Best Western Victoria Inn in Winnipeg.

For more information, contact Dr. Ian Seddon, Manitoba Swine Seminar co-chair, at 204-945-0353 or e-mail iseddon@gov.mb.ca.

need of the student.

Recently the committee made a commitment to help fund a part-time co-ordinator for Agriculture in the Classroom. The Agriculture in the Classroom group just completed a very successful Amazing Grains exhibit for students in the Westman area. Over two days, 850 to 900 grade 4 to 6 students toured grain, soils, insect and machinery safety displays. Over 50 volunteers each day spoke to the students on agriculture. This Amazing Grains display was in Winnipeg for three days in September.