

## Full-Fat Soybeans in Swine Rations

By: Mike Yaceniuk

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In the year 2003, Manitoba farmers seeded 220,000 acres to soybeans, an increase of 478% from 2000. It is expected that in the 2004 crop year seeded acreage will be approaching 250,000 acres. Currently, most of the soybeans are sold to US crushers for oil extraction. The resulting meal by-product is the single largest source of supplemental protein used in livestock feeds in North America. However, some soybeans remain in Manitoba and are heat-treated for use as animal feed.

Raw soybeans contain several anti-nutritional factors and must be cooked before they are used in swine diets with the exception of rations for gestating sows. Properly cooking the soybeans by either dry roasting, micronization or extrusion destroys several of the anti-nutritional factors and produces an acceptable protein source for swine. Roasting is the only process that can be done on farm.

Cooked full-fat soybeans contain less protein and lysine

than soybean meal but more fat and energy. Therefore, soybeans cannot replace soybean meal on a 'pound-for-pound' basis. The high fat content (18%) of heat-treated whole soybeans offers a convenient alternative to adding liquid fat to swine diets, especially in on-farm mixing situations. A benefit of the added fat, beyond animal performance gains, is the reduction of aerial dust, which may improve the health status of pigs and people working in swine facilities.

The storage life of the product should be considered when using heat processed full-fat soybeans in rations. Cooked whole beans are less susceptible to rancidity than raw soybeans. Once the beans are ground for feeding, storage time is reduced and it is recommended that the meal be consumed within two weeks.

Processed soybeans can be used in a variety of swine rations. Ground, roasted soybeans can be incorporated into starter pig rations, however the results may be variable and there may not be

any improvement to starter pigs fed soymeal. Extruded soybeans exhibit more consistent pig performance results than roasted beans in starter diets.

Grower and finisher hogs fed rations containing ground full-fat soybeans exhibit slight improvements in gain and feed efficiency as compared to typical rations. However, at high levels of inclusion, there is a noticeable deterioration of carcass and meat quality, especially in hogs fed corn-based rations. In finishing hogs' diets it may be advisable to maximize full-fat bean usage to 10% in corn-based rations and 20% in cereal-based rations.

Lactating sows benefit from the increase in energy density that rations containing added fat provide.

Unless a farmer grows soybeans expressly for livestock feeding, the only opportunity to incorporate beans in rations may be when

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# The Gut Environment in the Pig

By: John Maltman

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At birth the piglet gastrointestinal tract is virtually sterile but quickly becomes populated with both "healthy" and "harmful" bacteria from its environment. It appears that growth and rate of gain is proportional to the level of suppression of "unhealthy" bacteria that can be achieved by various means.

Weaning of the piglet causes dramatic changes in the cellular structure of the gut and also affects the balance in the intestinal populations. Bacterial colonization of the piglet intestine begins shortly after birth and is heavily influenced by the sanitary

state of its surroundings, and on an early, and steady supply of milk.

The struggle between health and illness begins with the positive influence of clean surroundings and the acid intestinal environment created as a result of digestion of milk. Healthy bacteria such as lactobacilli and bifido suppress coliform bacteria such as *E. coli* by maintaining an acid pH level. Dietary changes, which accompany weaning, can have a significant impact on the piglet. Solid food introduction needs to be accomplished without significantly reducing gut

acidity. Reduced gut acidity can allow proliferation of coliform bacteria which is associated with scours. Re-establishing normal gut acid levels reduces coliform bacteria and associated scouring.

Historically, the use of antibiotics has helped to control temporary increases in coliform bacteria and their related illness quite successfully.

Research has been conducted to study this relationship between bacterial populations, diet ingredients, and the health of the piglet with a view to minimizing the need for antibiotics. It is recognized that ration ingredients have differing abilities to neutralize stomach acid and some can cause irritations of the intestinal cell walls. This knowledge has allowed nutritionists to alter ingredients to minimize the ration impact on stomach and intestinal acidity thereby avoiding potential damage to the balance in bacterial populations.

Further studies examined fat and carbohydrate sources for their effect on intestine cellular structure and on the balance between bacteria populations. There are strong indications that short chain fats are



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## Hog Days 2003

By: Brian Cotton

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Hog Days 2003 will be held on December 3 and 4, 2003 in the Keystone Centre in Brandon. After 25 years this Trade Show continues to grow and attract new companies. Exhibitors appreciate the two-day show and the fact that it focuses only on the swine industry. Even though Manitoba's swine production has become more concentrated, with fewer producers, exhibitors need to go where their products and services can be seen and evaluated.

Approximately 150 companies from Quebec to British Columbia are represented, as well as some companies from the United States. Being centrally located in the country and having a significant hog production industry, this is a good location for exhibitors.

For swine producers it is a great opportunity to see many products and services from computer programs to feeding systems and odor control products, for their industry under one roof. Exhibitors usually have adequate staff available to show their product and answer product questions.

The seminar program will take place for an hour each morning and afternoon. The planning committee has put



together a program on current topics for the swine industry. The tentative program is as follows:

Dr. Jim House – New and exciting research on DON vomitoxin (*Fusarium*) in swine rations.

Dr. Martin Nyachoti – Adding alternative pulses, such as dry beans, to swine rations.

Dr. Harold Gonyou – Group housing of sows and animal welfare concerns.

Kevin Grier – The impact of BSE on the Canadian Swine Industry and what the potential impacts of COOL may still be.

There will also be an insurance panel including a producer that had a barn fire,

a representative from a fire department, and an insurance representative.

The Hog Days Committee is also helping to sponsor a number of health-related displays such as the Manitoba Lung Association, a hearing booth, the Farm and Rural Stress Line, and the Heart and Stroke Foundation. Be sure to visit this area in the show.

Visit our Hog Days web site at [www.hogdays.ca](http://www.hogdays.ca) for a listing of this year's exhibitors. This list will be updated as we receive applications. Other show information will also be posted as the show gets closer.

For more information on Hog Days 2003, contact Brian Cotton at 204- 726-6357, or e-mail at [bcotton@gov.mb.ca](mailto:bcotton@gov.mb.ca). I'll see you at the show.

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the soybeans are not deemed suitable for the crushing industry. Frost-damaged (immature) seeds have been shown to be the same in feeding value as whole soybeans when heat-treated (extruded) and feed to grower/finisher pigs.

When calculating the economics of replacing soybean meal with heat-treated soybeans consider all the associated costs, transportation, processing and shrinkage. Soybeans, like any other feed ingredient, should be included in rations based on the relative cost of the nutrients they supply.

Soybeans can be highly variable in nutrient content and it is advised that a chemical analysis be conducted on the heat-treated product before commencing ration formulation. All swine rations should be balanced for nutrients such as amino acids, minerals and vitamins, as well as energy and protein, and ration specifications should be based on expected feed intake and then adjusted to actual feed intakes.

For more information, contact your nearest Manitoba Agriculture and Food swine specialist.

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preferentially used as energy sources and can also exert a suppressive effect on harmful bacteria comparable to some antibiotics. Further research is ongoing to clarify and confirm these results. Similarly, some research has shown wheat to cause temporary intestinal irritation in newly weaned pigs suggesting another cereal should be used in early pig

diets. Both probiotics and prebiotics are showing continued progress in stimulating healthy bacterial populations.

Current research is examining this relationship between diet, growth and health in the pig and promises to refine ration formulation and reduce the need for antibiotics in pig feed.

## Upcoming Events

Mark your calendar for the following events:

**Hog Days** is scheduled for December 3 and 4, 2003 at the Keystone Centre in Brandon.

**The Manitoba Swine Seminar** is scheduled for January 28 and 29, 2004 at the Best Western Victoria Inn in Winnipeg.

**The Living with Livestock – Environment and Change** conference is scheduled for September 2004.

For more information about these events, please contact Dr. Ian Seddon at 204-945-0353 or email: [iseddon@gov.mb.ca](mailto:iseddon@gov.mb.ca).

