

Manitoba Swine UPDATE

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Organic Acids in Pig Production

Reduction in the use of antibiotics is a goal for all livestock producers. Good progress has been made in this respect and new information is emerging from research on additives that are achieving success in maintaining growth in the absence of antibiotic growth promoters (AGP).

The surface of the small intestine is a large area of the pig's body that is exposed to the environment. This represents opportunities for pathogens to impact the stability of the intestine and simulate the immune system. The intestinal microbiota are divided into two groups – gram negative and gram positive – and are named for the way their cellular structure absorbs stains for microscopic examination. A healthy balanced intestine would be approximately 90% gram positive, mostly *bactobacilli* bacteria and *staphylococcus*. The remaining 10% are gram negative, mostly *e-coli*, *enterobacteria*, and *salmonella*, which are responsible for disorders of digestion and diarrhea when in excessively high numbers. The use of antibiotic growth promoters (AGP) is reduced by utilizing management protocols to assist in improving sanitation in barns and to reduce stress on animals.

Organic acids have been used in feed for many years particularly for young pigs. Examinations have shown that significant control of pathogenic *e-coli* strains can be achieved using organic acids, but some acids are more effective than others. One Danish research report stated that the best-to-worst order of acids for control of *e-coli* is the following order: benzoic>fumaric>lactic>butyric>formic>propionic. While effective on their own, there is a pH related response with the best effects coming from high levels of benzoic and fumaric acid. Organic acids can act by having either a direct or an indirect effect on intestinal microbiota similar to the way in which antibiotic growth promoters work.

Dietary fibre is important to intestinal health because indigestible, fermentable fibre contributes to acidification

of the large intestine and produces energy for the pig. However, higher fibre levels will reduce overall intake and growth rate. Coarser feed will tend to reduce stomach pH and increase concentration of organic acids in the stomach over fine ground pelleted feed according to Danish research. Overly coarse ground feed will reduce performance so a balance needs to be found between performance and health where AGP use can be reduced.

Organic acids can be added to conventional diets to minimize the effects of finer grinds and lower fibre without reducing performance. A survey of research papers shows that these acids need to be added at levels between 1.5% and 2.2% of the diet to be effective in keeping the pH level of the stomach in the range that would kill gram negative bacteria. Whether this practice is economical and whether results will be consistent is not yet established.

It is clear that there are links between diet and health. These links are being explored and qualified so that new products can be developed which help lead to a healthy animal and stability of the intestinal biota.

References:

- 1) Organic Acid: Natural link between drug and growth promoter. Ir. G. Vanden Broek Feed mix V.8 N.2-2000 p22-24
- 2) Enhancing Intestinal Function to Treat and Prevent Intestinal Disease. Bent Borg Jensen et al, The International Symposium on Digestive Physiology in Pigs 2003 Proceedings V.1 p103-119
- 3) Enhancing Intestinal Function to Improve Growth and Efficiency. Douglas Burrin, Barbara Stall, 9th International Symposium on Digestive Physiology in Pigs 2003 Proceedings V.1 p121-137

*Information prepared by John Maltman, Swine Specialist,
Manitoba Agriculture, Food and Rural Initiatives*

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Manitoba 
Building for the Future

What Does It Cost to Raise A Pig?

The table below has been prepared to serve as a guide for calculating total production costs. To more accurately reflect the true cost of your swine operation, values specific to that operation should be substituted for those provided. All swine production units should attempt to calculate their production costs and subsequently their breakeven price. The breakeven price can be used to assist with risk

reduction decisions such as forward pricing of pigs. The following costs are point-in-time as of December 20, 2004 and do not represent the average for the year.

Buildings are valued at new cost and feed is **commercially prepared**.

Table 1 Total Cost of Production

Costs	Farrow/Finish (113 kg)	Farrow/Wean (5 kg)	Nursery (5-23 kg)	Grow/Finish (23-113 kg)
Feed	\$75.82 (56.2%)	\$10.65 (31.0%)	\$14.85 (22.9%)	\$49.59 (34.3%)
Variable	29.40 (21.8%)	13.04 (37.9%)	3.78 (5.8%)	13.01 (9.0%)
Feeder Pig	– –	– –	42.16 (65.0%)	67.62 (46.8%)
Fixed	19.10 (14.2%)	5.72 (16.6%)	2.83 (4.4%)	10.26 (7.1%)
Labor	10.55 (7.8%)	5.00 (14.5%)	1.25 (1.9%)	4.07 (2.8%)
Total (Per pig sold)	\$134.87	\$34.41	\$64.87	\$144.55

As can be seen in Table 1, feed accounts for the largest portion of production costs of the farrow/finish units, comprising 56.2% of the total. Due to the buoyant market, corresponding impact on feeder pig prices and reduced feed ingredient prices, the feeder pig is currently the greatest single cost in nursery and grow/finish barns. Proportionally, feed is the second costliest factor in producing a weanling on a farrow/wean unit, compromising 31% of total costs.

The first and short-term approach to reducing production costs is a complete review of feed costs, as this component constitutes a significant portion of variable costs. Controlling feed cost (ration cost and feed efficiency) is the only way to substantially influence variable cost. Improving animal genetics and health, reducing feed wastage, phase feeding, split-sex feeding and cooperative purchasing are some factors that should be employed in a swine operation to reduce feed costs.

The second and long-term approach to improving profitability is to increase the throughput of the operation. Realistic goals must be set and realized in order to remain competitive.

Other factors to consider are:

- Are you getting the best price for your pigs; are the pigs in the appropriate weight range and are you reducing risk by using forward pricing strategies?

- Have **all** of your input costs been reviewed for their cost effectiveness?
- Are you willing to become part of a network for either purchasing or production? Is contract rearing of pigs an option you should be considering?
- Do you keep accurate production and financial records that are used in management decisions? If required could you itemize your costs on a per unit basis (i.e. per pig, per kg saleable pork, etc.)?
- Is your farm attaining the highest levels of productivity and efficiency? Is training or upgrading for you or your staff in order?
- Do you have a bio-security protocol and quality assurance program in place?
- Do you use the services of an advisor to discuss and evaluate all aspects of your farming operation?

For more information on these and other topics, contact your nearest MAFRI swine specialist.

*Information prepared by Mike Yaceniuk,
Swine Specialist, Manitoba Agriculture,
Food and Rural Initiatives*