

Feature Research Project

Working towards phosphorus balance while creating markets for Manitoba crops and co-products

If you are plugged in to livestock agriculture in Manitoba, you are already well aware phosphorus based manure management regulations are coming into full effect as of 2013. In order for Manitoba's livestock producers to comply with the revised regulations and remain economically competitive, they must have access to practical and affordable solutions for manure phosphorus management. At last winter's Achieving Manure Phosphorus Balance in Manitoba Workshop (pworkshop2009.com), industry and government stakeholders recognized the need to use a holistic approach to P management on the whole farm, including adjustments to feed ingredients or diet formulations. For example, fine-tuning the amount of available P in feed to match animal P requirements reduces not only the amount of P in manure, but also the amount purchased and imported onto a farm. Yet the drivers for selecting feed ingredients are economics and performance indices that do not always consider potential implications for manure P management.

The workshop prompted Carole Furedi and Dean Gurney of The Puratone Corporation to team up with the University of Manitoba and the National Centre for Livestock and the Environment, along with funding partners the Manitoba Rural Adaptation Council, Farmer's Edge and the Manitoba Pulse Growers Association, for a comprehensive study evaluating diets containing zero tannin faba beans and wheat-corn DDGS produced in Manitoba. Dean Gurney, environmental manager explains the drive behind the whole-farm approach. "The workshop got us thinking that, if we're choosing feed ingredients based on cost, maybe we should expand our scope to the whole pig production and manure management system to get at the true costs. We know pigs drink more with certain feed ingredients and we know feed ingredients can alter manure nitrogen and phosphorus content as well as the total amount of excretion. When you calculate how these changes translate to manure handling costs, particularly in light of phosphorus-based manure management regulations, are we still coming out ahead?"

Dr. Elijah Kiarie, a swine nutritionist with the Dept. of Animal Science at the U of M, leads the digestibility component of the study. "Before we can develop proper rations, we need to know the digestible energy and nutrient content of zero-tannin faba beans and corn-wheat DDGS. We will use this information to formulate the commercial diets for the whole-farm performance trials," says Kiarie of the U of M's role in the project. Carole Furedi, Puratone's continuous improvement and research facilitator will oversee the whole-barn nursery and grow-finish evaluations. "We're conducting whole animal and whole barn evaluations at two of Puratone's facilities, looking at how well different inclusion rates of DDGS and zero tannin faba beans perform at these different scales. Ultimately we're doing this to determine the value of these ingredients to the swine industry." Measurements of water consumption, manure nutrient composition, and manure volume and consistency will form the basis of the non-animal component of the project.

"We're optimistic the outcomes of this project will be win-win for both pig and crop producers," Furedi concludes. Having a clearer understanding of the whole-animal plus whole-barn impact of a lower cost feed ingredient is anticipated to improve producer confidence in selecting these ingredients as part of their rations and aid in their manure management planning. Having this type of comprehensive feed evaluation information for locally grown crops and locally derived co-products could help drive demand for these products and potentially displace a portion of imported feeds with lower cost local options.



Elijah Kiarie, a U of M swine nutritionist, displays (from left) the wheat DDGS, zero tannin faba bean (whole and flour) and corn DDGS to be evaluated

Contact Carole Furedi (CFuredi@puratone.com) or Elijah Kiarie (Elijah_Kiarie@umanitoba.ca) for more information

For a complete listing of NCLE research projects on achieving phosphorus balance in livestock production systems, download the project summary handout on our website (<http://umanitoba.ca/afs/ncle/MPBalance.html>)

Visit our **website** <http://www.umanitoba.ca/afs/ncle/> to learn more about these and other **NCLE research projects**.

Instant Update

NCLE Chair stops by the U.S. Dairy Forage Research Center (USDFRC)

NCLE Chair Don Flaten noted many parallels between our multi-disciplinary approach at NCLE and the approach of USDFRC and its partners at the University of Wisconsin and the Institute for Environmentally Integrated Dairy Management. Building on this initial meeting with USDFRC researchers, NCLE will continue to explore opportunities to collaborate. Dr. Flaten visited the centre while in Madison, WI in July for the annual meeting of SERA-17, a group of scientists dedicated to reducing phosphorus losses from agriculture. For more information about the U.S. Dairy Forage Research Center, check out their website at: http://www.ars.usda.gov/main/site_main.htm?modecode=36-55-30-00.

Research Update

August 3, 2010. Mark Fynn, MSc candidate successfully defends thesis on modeling sow longevity. Mark explored the use of animal welfare and economics parameters in modeling to determine the optimal time to cull sows. He also looked at the role group housing system might play in determining the optimal cull time by comparing these parameters in the two different group housing systems at the Glenlea Research Station. ARDI funded.

NCLE Long Term Field Laboratory showing manure treatment effects. Don Flaten challenged participants at the recent Soil & Manure Management Field Workshop to visually rank plots that have received "equivalent" amounts of available N as synthetic fertilizer, solid manure or liquid manure. The plots that received solid manure were ranked lowest, indicating lower N supply, similar to measured results from the two previous years of this study. ARDI funded.



Field lab: Workshop participants contemplate plot ranking

New Literature Review:

Evaluation of the opportunity for manure treatment/processing technologies to achieve manure phosphorus balance. Contact: Nazim Cicek (nazim_cicek@umanitoba.ca).

[Download](#). MLMMI funded. This review is one component of the [Manure P Balance Workshop](#) priority to evaluate the opportunity for manure treatment to achieve manure P balance.

New Publication:

Latest publication from the La Broquerie project - Wilson, C., M. Undi, M. Tenuta, K.M. Wittenberg, D. Flaten, D.O. Krause, M.H. Entz, R. Holley, and K.H. Ominski. 2010. *Pasture productivity, cattle productivity and metabolic status following fertilization of a grassland with liquid hog manure: A three-year study*. Canadian Journal of Animal Science 90: 233-243. Visit <http://umanitoba.ca/afs/labroquerie> for more results and publication listings for the La Broquerie Study.

Extension & Outreach Update

First offering of Soil & Manure Management Field Workshop well attended

July 23 - Rubber boots on foot and worksheets in hand, 78 keen individuals spent the day at the Glenlea Research Station and Kelburn farm honing their soil and manure management skills. MAFRI, NCLE, Richardson International and Agriculture and Agri-Food Canada joined forces to deliver this interactive 8 station in-the-field learning session. Building on this success, look for more opportunities for knowledge exchange from this group in the future. Many thanks to everyone involved!



John Heard, MAFRI, explains the manure N ramp calibration strip demo at the field workshop

Tours:

July 22, Glenlea Research Station - Researchers updated **Agri-Food Research and Development Initiative (ARDI)** council members on several ARDI-funded projects featuring beef cattle, swine, poultry and dairy research as well as manure treatment and field management research taking place.

September 1, Glenlea Research Station - NCLE hosts **Manitoba Livestock Manure Management Initiative** board members to discuss current MLMMI-funded projects and explore future opportunities in manure management research.