



# News From New Bolton Center...

School of Veterinary Medicine  
UNIVERSITY OF PENNSYLVANIA

## BIG IS NOT NECESSARILY BAD FOR THE ENVIRONMENT: NUTRIENT MANAGEMENT PRACTICES OF PENNSYLVANIA SWINE FARMERS

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As the American swine industry enters the 21st century, the major challenge it faces is the environment. Heightened environmental awareness by producers, neighbors, and consumers alike demands that pork production proceed in harmony with preservation of the land, water, and air. Moratoriums on the construction of new swine operations are being put in place by state governments across the country in the name of environmental concern. However, in some cases, these controversial policy decisions are fueled in part by public fears about many other aspects of large-scale swine production, such as absentee ownership and potential odor-problems.

A similar moratorium on the construction of large farms or so-called concentrated animal feeding operations (CAFOs) has resulted from recent actions by the

Pennsylvania State Department of Environmental Protection (DEP). A federal mandate on water quality has called for revision of state CAFO permitting requirements. Despite the fact that existing Pennsylvania laws are some of the country's most progressive and stringent concerning farm nutrient management, DEP has suspended final decisions on all CAFO permit applications until changes in the permitting process are finalized. This defacto moratorium on construction of new swine facilities effectively halts further expansion of the Pennsylvania swine industry.

Potential problems with water quality created by growth in the local swine industry have long been recognized. Much of our Pennsylvania swine industry is located within the Susquehanna River Basin watershed, one of the major tributaries of the Chesapeake Bay. Deteriorating water quality in the Bay has changed both fish and plant life there. These changes have focused the attention of concerned commercial fishermen, recreational users, and ecologists on agriculture's contribution to non-point source pollution in the Bay. Thus, the environmental impact of the Pennsylvania swine industry has come under great scrutiny.

Production of pork by the next generation of Pennsylvania swine farmers will require environmentally sound management practices. Paramount to continued swine production in this state is both the opportunity for the industry to ex-

Table I - Demographics of study herds

Demographic	Sow Units		Finish Floors	
	Small	Large	Small	Large
No of herds	76	9	102	30
Total no of animals	10,501	12,225	56,223	86,540
Mean no of animals/herd	138	1,358	551	2,882
Median no of animals/herd	95	1,336	375	2,300

Table II - Nutrient management survey questions

- A - Do you test your manure for its nutrient value of nitrogen?
- B - Do you test your manure for its nutrient value of phosphorus?
- C - Do you keep records of manure application before planting corn or small grains?
- D - Is your manure applied with a calibrated spreader?
- E - Do you refrain from spreading manure in winter time?
- F - Is your manure application handled by a contract manure applicator?
- G - Do you practice split-sex feeding?
- H - Do you practice phase feeding (use 4 or more rations in either nursery or grow/finish)?

Table III - Affirmative answers to nutrient management survey questions

Questions	Sow Units		Finish Floors	
	Small	Large	Small	Large
A	25%	67%	24%	47%
B	21%	67%	22%	33%
C	30%	67%	27%	47%
D	47%	89%	46%	67%
E	41%	89%	46%	67%
F	43%	67%	30%	57%
G			26%	77%
H	14%	43%	25%	73%

pand and the development of cost-effective solutions to nutrient management problems. With regard to the latter point, we recently concluded a survey of management practices by Pennsylvania swine farmers'. The goal of our study was to identify opportunities for novel and innovative, yet cost-effective, solutions to swine nutrient management. We have documented striking differences between swine operation in their ability to capitalize on nutrient management advances. Perhaps to the surprise of some, of the farms surveyed, we have found that the large ones can be twice as likely as the small to implement environmentally superior nutrient management programs. These results suggest that the small farm, not the large farm, could be the more immediate threat to the environment in Pennsylvania. These findings are described in detail below.

Nutrients flow through a farm or production system as part of a cycle. Feed becomes meat and manure, manure is applied to crops, and crops become feed. A ration poorly matched to a pig's growth requirements will result in excess nutrients in the manure as they pass unused through the animal. When such manure is applied over and above the needs of a crop, excess nutrients remain in the soil. Such excess nutrients are

at risk of being lost from the cycle to the environment. Leaching or runoff of these excess nutrients result in pollution of the environment. Thus, we questioned swine producers about manure handling, as well as cropping and animal nutrition practices.

Study farms were categorized by operation type (sow unit or finish floor), then stratified by size. Farms with >600 sows or >2000 head of grow-finish pigs were considered large. Demographics of study herds are shown in Table I. Producer responses to the 8 questions listed in Table II are summarized in Table III.

The major finding of our survey was that large swine units are on average 1½ to 2 times more likely to implement environmentally sound nutrient management practices. Large swine operations more often used progressive nutritional practices such as split sex feeding or phase feeding that reduce or limit nutrient load in the manure. Large swine units are also more aware of their manure nutrient content and more capable of effectively utilizing this information (e.g. keep records of manure application and apply manure with a calibrated spreader).

Why is a large swine unit more likely to have implemented environmentally-sound management practices? The larger size unit may be able to capture benefits as-

sociated with economies of scale in nutrient management. For instance, large operations can afford to mix and feed a larger number of diets, or use contract manure handlers that provide better access to technologies for progressive manure management practices. The large swine unit is also more likely to exceed the two-animal unit/acre criterion. Thus, there are environmental benefits from the increased scrutiny of these large

producers by existing state nutrient management regulations.

The results of this study suggest that *big is not necessarily bad* for the environment when it comes to swine nutrient management. Large swine units can be more likely than small farms to utilize progressive, environmentally conscious nutrient management practices. In theory, the possibility of catastrophic failure of manure storage facilities on such large or concentrated animal farm operations provides a great potential risk to the environment. However, existing regulations require that these facilities have adequate construction, monitoring and safety systems to prevent such an unqualified environmental disaster. A corollary of our work, *perhaps contrary to popular belief*, is that small swine producers could represent a more immediate threat to the environment. In the future, smaller producers must become more pro-active with regard to environmental concerns and implement more progressive nutrient management practices.

To facilitate the goal of increased environmental awareness among all Pennsylvania swine farmers, we are conducting an environmental educational program in collaboration with the National Pork Producers Council and the Pennsylvania State Cooperative Extension Service. If you are interested in participating in the Environmental Assurance Program which aims to promote an active understanding of issues such as manure management, odor control and neighbor relations, call either Kimberly Klesse (610-444-5800 ext 2345) or Bob Mikesell (814-865-2987) to schedule a farm visit.

1-Previous nutrient management fellows at the University of Pennsylvania School of Veterinary Medicine, Wayne Hassinger and Kelli Monahan, designed the survey, then collected and analyzed the data described here. This work was generously supported by a grant from the Pennsylvania Friends of Agriculture Foundation.

## More Than 170 Riders In Handicapped Riders Event

MALVERN (Chester Co.) — The 19th annual Handicapped Riders Event of the Devon Horse show took place on Saturday, May 23 here at the Thorncroft Equestrian Center.

More than 170 riders entered the show, and competed in more than 60 different classes.

Riders of all ages and disabilities, mental and physical, competed in trail, equitation, jumping, and dressage classes, and a combined driving event (cones, dressage, and cross country marathon). The show, sponsored by Brushwood Stables in Malvern, is put on by the joint efforts of Thorncroft Equestrian Center and The Bryn Mawr Rehab Hospital.

On Sunday, May 24, the division champions from the Saturday classes met at the Devon Horse Show Grounds in the Dixon Oval to compete in the grand championship class. Barbara Rosoff of Phoenixville and Babsie Clark of Kirkwood, judged in the class. Riders were asked to ride as a group and perform individual tests.

Grand champion was awarded

to John Greenwood of Grantville. Erica Freed, also of Grantwood, was reserve. John was presented the Hopo Montgomery Scott Perpetual Trophy. Scott was a long-time supporter of riding for the handicapped. She won the trophy herself at the Bryn Mawr Horse Show in 1930, and in 1993 donated it to The Handicapped Riders Event of the Devon Horse Show.

One of the many additional trophies awarded was the Brushwood (for best handicapped rider), won by Bernadette McMullen of Special Equestrians in Pineville and donated by Mrs. J. Maxwell Moran of Brushwood Stables in Malvern. Moran has been a generous supporter of the show and a tireless volunteer the day of the event.

Also participating at Devon were the Thorncroft Mainstreamers. The group is an eight-horse, nine-rider team consisting of handicapped and non-handicapped riders ages 8-20. These ambassadors to Thorncroft have travelled to New York, Virginia, and Harrisburg to present their drill.



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