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Swine Welfare Research at New Bolton Center Offers Promise for Pig and Farmer

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**SWINE WELFARE RESEARCH
AT NEW BOLTON CENTER
OFFERS PROMISE FOR
PIG AND FARMER**

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ABOUT THE COVER:

Research by Thomas Parsons, VMD, PhD at the Swine Teaching and Research Center on Penn Vet's New Bolton Center Campus is having far-reaching impact on swine husbandry and production.

Correction: In the Number76/Winter 2012 issue of *Bellwether*, we misnamed the ICU technician pictured holding German shepherd puppy, Basil. The technician should have been identified as Jessica Bosco.

GOOD FOR THE PIG, GOOD FOR THE FARMER

Enhanced living environments for swine may positively impact a farmer's bottom line

BY SALLY SILVERMAN

Larry Harnish has his hands full. As the owner of a family farm in Oxford, PA, Harnish cares for 700 sows almost all by himself. With the exception of a few hours of help each week from his wife, and occasional assistance from a hired hand, he does it all. He can manage, he said, because of the system he uses.

Harnish was one of first farmers to adopt the “Penn” Gestation Housing and Electronic Feeding System developed by Thomas Parsons, VMD, PhD, director of Penn Vet’s Swine Teaching and Research Center (STRC).

ADOPTING A NEW STYLE OF FARMING

More than 90 percent of gestating mother sows in this country are raised in a gestation stall or crate. Widely accepted by swine farmers about 35 years ago, the gestation stall provided a solution to many of the vexing challenges related to the issues of social hierarchy when sows were housed in groups. Dominant animals got all the limited resources, such as feed, and became over-conditioned, while the more timid sows suffered from malnourishment and were at risk of career-ending injuries resulting from aggression and fighting.

These stalls, however, were small. On average, a gestation stall measures seven feet long and only two feet wide, preventing the sow from being able to turn around for the entirety of the near four months that she is pregnant. Many people today find that restriction on a pig’s movement and limits to other natural behaviors as untenable.

Dr. Parsons’ system, however, replaces the use of this kind of gestation stall and instead implements a pen system whereby the mother pigs have more freedom of movement.

This non-crate method of raising pigs, driven by animal welfare concerns, is the focus of research at the STRC. Opened in 2001 on Penn Vet’s New Bolton Center campus, the STRC

was one of the first swine facilities at a veterinary school in the US with a mission of applied swine research and the teaching of swine production medicine. And it’s here, at the 16,000-square-foot STRC facility at New Bolton Center, that alternative models for the housing of pregnant and lactating sows are investigated.

Led by Dr. Parsons, the research here is influencing producers nationally — about 1 percent of all sows in the US are now raised according to the Penn Vet model, and interest is growing internationally.

Harnish is among the 1 percent. His father had a small pig business and believed that a non-crated system was quieter because the pigs were less agitated. When Harnish heard about this new system developed at Penn Vet, he consulted with Dr. Parsons to talk about how the method could be utilized on his Oxford farm.

AN OPEN CONCEPT IN OXFORD

At the center of the Harnish facility is what looks like a comfortable family room with a computer, printer and an overstuffed easy chair. Through a window, the gestation side of the operation can be viewed. It’s an open space — enough to allow each sow about 20 square feet of space on average.

“It’s enough,” said Harnish, “for one sow to get away from another if need be. It keeps aggressive behavior down.”





The sows wander about, lie on the concrete loafing slabs lining one side, or push their way, one by one, into the electronic feeding mechanism. They appear relaxed and, apart from the occasional squeals accompanying disputes about territory or hierarchy, are quiet. There is plenty of natural light and ventilation.

At the other side of the building are two large maternity or farrowing rooms where the sows and piglets live until weaning, each family unit occupying a space about 35 square feet, where piglets play with one another, suckle or nap. Harnish keeps the piglets until they are weaned, at age 21 days. They are then sent to another local producer to be raised into adulthood.

A LIVING LAB, A WORKING CLASSROOM

The Harnish facility resembles that at the STRC where the gestation area consists of partitioned bays for sleeping and loafing. Renovated in 2010, the STRC has areas with different bedding substances and an outdoor loafing area, both providing opportunities for behavioral research.

At the STRC, there is also a large window looking out onto the gestation area, and another for observation of farrowing enclosures for mother sows and their piglets. These windows are on either side of a 1,000-square-foot classroom. Here researchers, students and guests, with the help of a video monitoring system, can observe the pigs without disturbing them.

At the center of both locations – on Harnish’s farm and in the STRC – is the electronic sow feeder (ESF).

It’s a computerized feeding system that includes micro-chipping a sow’s ear to identify her and ensure the daily delivery of a precise amount of food to each gestating sow. The implementation of ESF was based on Dr. Parson’s study of European farms, where consumer demands have strongly influenced the development of alternative husbandry practices.

In traditional housing, sows in crates spill feed, and neighboring sows are often able to steal; some pigs are getting too much, while others are not getting enough, and a percentage is always lost.

At his farm, Harnish walks the barn carrying an electronic tag reader. If a sow looks like she could use a little additional feed, he scans the ear tag and makes a note on the handheld device. When he returns it to the docking cradle attached to his computer in the office, it will update the information and that sow’s ration will be increased. The system also allows Harnish to easily mark or sort animals, selecting individuals or groups that might need vaccinations or other care.

These labor-saving features mean decreased costs for producers.

“We know that we can match the status quo system from a cost and production perspective,” said Dr. Parsons. “We believe that there are upsides to this technology, but we’re not sure we’ve captured all the benefits yet.”



Above, Larry Harnish scans a sow that may benefit from a change in her diet. Below, Harnish (right) shares progress in his herd with Dr. Parsons (left).



WELFARE AND EFFICIENCY

In 1997, the European Union banned gestation stalls, leading to a 15-year phase out of this husbandry practice that is mandated to be complete in all member states by December 31, 2012. To date in the US, Florida, Arizona and California have banned gestation stalls through voter referendums. And in Maine, Michigan, Colorado, Oregon and Ohio, similar laws have been passed. The phase-in period for implementation of these measures varies from state to state and ranges from seven to 15 years.

In this country as in Europe, where gestation models with pens rather than stalls were first initiated, the movement was driven by concerns for animal welfare. Adoption of the model, however, is spreading because it is proving to be efficient as well.

“We are seeing developing countries starting to adopt the practices that we are developing here,” said Dr. Parsons. “Industry leaders from China have come here to our STRC to train.”

Similarly, Dr. Parsons does his fair share of traveling, taking his knowledge on the road.

GAINING MOMENTUM

In addition to the state laws being passed and slated for implementation, consumer concerns about sow housing are driving demand for crate-free pork in the marketplace.

Smithfield and Hormel, both suppliers for branded pork products, have committed to eliminating gestation stalls on their farms. In the food service sector, the Compass group and Bon Appetit have announced plans to eliminate the use of pork produced from animals housed in gestation stalls.

Several retailers of pork products including the grocer Safeway are also taking notice of consumer preferences, and such popular fast food restaurants as McDonald’s, Burger King, Wendy’s and Denny’s have all taken strides to require their pork producers to transition from the use of gestation stalls. Burger King, in particular, has set guidelines to require this transition be completed by 2017.

So it’s not surprising that Dr. Parsons’ work has also been noticed – and supported – by a number of organizations through the funding of three research fellows for STRC. Each entity is working with Dr. Parsons to investigate different aspects of the swine ethology, the behavioral patterns of pigs.

The post-doctoral fellows, funded separately by the American Society for the Prevention of Cruelty to Animals (ASPCA), the Pig Improvement Company (PIC) and Swiss Village Farm (SVF) Foundation, will be studying both the social behavior of gestating sows and the maternal behavior of lactating sows.

Suzanne McMillan, director of the ASPCA’s Farm Animal Welfare Campaign said, “The ASPCA is proud to contribute to Penn’s important research to improve the welfare of pigs. Farm animals should be treated with dignity and compassion, and provided with conditions that cause as little suffering as possible. Tom’s research is an important step in that direction.”



Left, pigs at New Bolton Center’s Swine Teaching and Research Center loaf about. Below, a mother sow tends to her young in a larger farrowing pen than what’s found in typical industry farms.



For PIC, the collaboration with Dr. Parsons and the Penn Vet STRC provides an opportunity to investigate genetic improvement to pork chain customers through technology, health and services.

PIC, which works with pig producers to improve breeding stock by identifying desirable hereditary traits, is interested in animal welfare, but also understands the need to maintain or increase productivity. That is, a system must not only care for the animals in a new way, it also must make sense to a producer and provide economic stability and sustainability.

“PIC understands that compromising animal wellbeing does not result in efficient production for our customers,” said Craig R. G. Lewis, PhD. “Our research program aims to optimize our understanding of the management of our animals and accelerate genetic gain with the primary result of contributing to profitable production for our customers. Of course, with our customers having profitable sustainable production, then we are doing our part in providing a safe and affordable protein source for an expanding global population.”

SVF is also interested in genetics and heredity of the swine, but for them it’s about preserving heritage breeds.

“The collaboration and the use of heritage breed swine in this project will help us convey a very important story to the public: After decades of breeding for weight gain and confinement farming, we have likely bred out many important traits. As in this case, mothering ability,” said Peter Borden, executive director of SVF. “When Dr. Parsons asked if we could assist, we immediately saw this as a tool to educate the public about our mission — the preservation and ultimate use of potentially



lost genetic traits. The better educated the consumer, the more support these heritage breed farmers will receive for their efforts.”

For 10 years, SVF has focused its cryopreservation efforts on cattle, sheep and goats, but will now be working swine into its program.

“The Penn project seemed like an ideal way to encourage ongoing conservation efforts that support the marketing of heritage breeds of swine,” said Borden. “If we can successfully convince swine farmers to use Dr. Parson’s humane handling system with heritage breeds, it is a win-win for the animals, the individual consumer and our national food safety.”

CHOOSING THE RIGHT PIGS

Where design of animal housing and electronic delivery of food have been the emphasis of the first generation of the STRC research at Penn Vet, the next generation will focus on the animals.

“For 30 or 40 years, the industry has been selecting animals for crate-based housing. Now we want to know what is the right animal to use in alternative systems,” said Dr. Parsons.

One of the operating hypotheses is that different personality types can be identified in pigs. If that’s true, he posits, then there may be an optimal mix of different personality types that yields the most functional social group in a pen gestation system — a piggy Myers-Briggs test of sorts.

“There is an entire genetic pool that has been away from the selection pressure of commercial industry,” said Dr. Parsons, referring to the heritage breeds in which SVF is so interested.

It is possible that personality traits more suited to pen gestation could be found in those breeds. They are also important for another reason: lack of genetic diversity creates a liability. With so much of the industry reliant on a concentrated genetic profile, the industry is potentially vulnerable to decimation in the event of a serious infectious disease outbreak. Heritage breeds, on the other hand, might harbor unique resistance to disease or have other advantageous traits that distinguish them.

“This is all part of the broad spectrum of research focused on finding the right animals for these new and emerging housing systems,” said Dr. Parsons.

FEEDING THE GLOBAL APPETITE

Parsons recognizes that the goal of increased production and improved welfare is a long road.

“We knew 10 years ago that changing the mindset about gestation crates would be the challenge,” said Dr. Parsons. “In the past five years we have seen 1 percent of the industry utilize our system. We saw the first change in farms with 100 sows, but now we are seeing this model implemented on farms with

thousands of sows. In fact, 60,000 sows in the United States are now living in crate-free or in the ‘Penn gestation’ housing system. Our focus now has to be: what will the industry need in order to grow in the next 10 years?”

While Dr. Parsons works closely with some local farms, like Harnish’s, he appreciates the global impact of his research and recognizes that the global demand for animal protein continues to grow at an unprecedented rate.

That need is a consideration driving all food production industries worldwide.

China, the most populated country in the world with one of the fastest growing economies, is seeing a doubling of per capita consumption of animal protein every 10 years. Pork is a mainstay of Chinese cuisine, and is the most consumed animal protein in the world — accounting for 36 percent of the world meat intake.

“Our goal is to help animal agriculture reinvent itself to meet the changing expectations of a local society without compromising production sorely needed to meet burgeoning global demands for animal proteins,” said Dr. Parsons.

THE IMPORTANCE OF PEOPLE

In the meantime, Dr. Parsons keeps in close touch with Harnish, visiting the Oxford farm regularly, sending students to learn from him, and in some cases accessing the computer remotely, to help ensure that Harnish is fully capturing the upside potential of the technology.

“The health of this herd has been great, and they seem comfortable. And our productivity is up. We are seeing 28 or more piglets weaned per sow per year, almost a 40 percent increase from what we had on my father’s farm,” said Harnish.

While the numbers are impressive, that was not the only motivation for Harnish to embrace the pen gestation system.

“As human beings we are called on to do the best that we can for our animals. They, in turn will respond in a positive way with increased productivity,” he said.

“The varied degrees of success on our farms with crate-alternatives reinforce the notion that a sow’s life is not necessarily improved by the simple ability to turn around,” said Dr. Parsons. “On the other hand, our experience has documented that there are commercially viable, crate-free farms out there where the welfare of the sows is undoubtedly improved.”

Harnish’s farm is proof positive.

“In these situations,” said Dr. Parsons, “the farm staff has quickly responded to champion the new challenges associated with pen gestation — such as managing the effects of the social hierarchy.”

Parsons’ experience from establishing pen gestation on over 35 farms across the country emphasizes that it is the people and not only the housing system that makes for a happy pig. 