



## Introducing

# OPTIONS

## IMPACTS OF OPEN VERSUS CLOSED HERDS

By Libby Williams

**Traditionally, herdsires were traded like commodities. They were sold and purchased, back and forth from one operation to the next on the basis of increasing each herd's genetic potential. Producers spent high dollars on these boars, brought them home, exposed them to existing herds and used them to breed sows. Genetic improvement was the main priority; herd health and disease were limiting factors.**

**B**ut today, it's a different story. Herd health has become a major concern to the swine industry since the introduction of infectious diseases like Porcine Respiratory and Reproductive Syndrome (PRRS). Improved artificial insemination technology has made it feasible to cease the introduction of live animals onto the farm to reduce health risks. The live boar trade model has been replaced with the boar by-product. Not only have most herd sires been dismissed, but in some

systems, purchasing replacement females has also come to a standstill, with some herds maintained completely closed for health security. When looking at different systems, breeders have to ask: How much risk is an operation willing to take?

### Closed doors

Closing a herd versus purchasing outside stock is debatable when it comes to herd health. The fact is, neither system is totally free of health risks. Dr. Max Rodibaugh, veterinarian at Swine

Health Services LLC, in Frankfort, Ind., suggests health risks are present in both closed and open purchasing systems. The decisive factor is the amount of risk the operation is willing to take.

"It's probably always been easier over the years to control health when the herd is closed, so you have fewer external risks," Rodibaugh says. However, he noted there is still health risk with purchasing semen.

Closed herds come in two varieties: those internally closed and completely

free of any outside introductions, and those willing to introduce tested semen. Without introducing a vehicle to improve genetics, an entirely closed herd is difficult to maintain, and most closed herds typically choose to take the risk of introducing semen as a potential opportunity cost in exchange for genetic improvement. However, semen can potentially pose as much threat as purchasing live animals, if it is not guaranteed pathogen-free. Sperm concentration, motility and morphology are standard semen testing procedures, but some infectious diseases, like PRRS, can also be transmitted through the semen. That's why testing is so important.

Everett Forkner, owner and operator of TruLine Genetics, in Richards, Mo., has maintained a closed herd for 19 years and acknowledges that risk. "We are very particular about where we buy our semen," he says. "The health protocol of testing the boars that the semen comes from on a regular basis is what is important."

Most U.S. boar studs guarantee shipment of functional semen, but don't necessarily test to ensure it is pathogen-free. Many studs collect blood before or during every semen collection using a blood serum polymerase chain reaction (PCR) protocol, which scans the blood for presence of PRRS or other diseases. Upon clearance of the disease, semen can be shipped.

Although there are qualifications for semen that may be exported internationally, there are no internal U.S. protocols for semen quality. It is up to the producer to minimize risk through purchasing semen.

"You still want to be sure that you check out the biosecurity and health status of that (boar) stud," Rodibaugh says.

But those who think closing their herd will be an easy transition, or that it is a more cost effective choice, need to study their options. In terms of management, selection and record keeping, maintaining a closed herd is an intense process. Closed herd systems are more

suited for operations that already have a complete record system in place, a mapped genetic selection plan, and are willing to put in extra time and effort to get their ideal herd health results.

"What I've seen over the years is that it looks easy and it looks like it is going to just be a big savings – but if that producer isn't dedicated to doing the things that he or she needs to do to do it right, it is going to cost them money," Rodibaugh says.

**"You can make any system work, it is just thinking through how you can minimize your risk of disease, while at the same time maximizing your genetic improvement. It's a balance."**

– Max Rodibaugh

Forkner, who runs a 500-sow closed operation, has not introduced new animals since 1992. He has capitalized on this closed system in terms of biosecurity and herd health, and has used it to corner a niche market: antibiotic-free pork. TruLine's hogs that are not used as breeding stock are sent to an all natural, antibiotic-free pork program.

"We are entering our sixth year of using no antibiotics in baby pigs from birth to market. In fact, we very seldom use any antibiotics in the whole herd," says Forkner. "It is almost imperative that if you are going to antibiotic free production that you close your herd, stabilize your health and have optimum biosecurity."

Forkner says TruLine Genetics is committed to building immunity within the herd via home raised gilts. By using an intense selection protocol that focuses on genetic disease resistance, Forkner has been able to improve herd immunity, without relying on antibiotics.

"Not only are we getting a premium for our antibiotic-free production, but now I've had three generations of genetic selection with no antibiotic support to begin to draw out of for my selection program," Forkner says. "Those

animals are more genetically healthy and have more genetic disease tolerance than the average of the population."

Closing the herd is the least-risk option from a herd health standpoint. TruLine Genetics is one of few operations that is dedicated to keeping their herd closed. Although slightly different from the basic, traditional model of a closed herd system, Forkner has reaped a premium from intelligent production practices and management decisions.

"The only real struggle we've had is learning to cope with the use of no antibiotics. There is just a different set of management and nutrition that we have to address," Forkner says.

## Open house

Closed herds are certainly not the standard – roughly 75 percent of the swine industry is involved in purchasing and introducing replacement gilts into their herds. Yet, some operations are intent on maintaining closed herds because of health risks.

Introducing pedigrees that have not been established in the base herd increases genetic variation and benefits genetic progress. However, health decisions have to be addressed to a larger extent because direct contact is a route for disease transmission.

Differences in operation goals also come into play when deciding a purchasing strategy. A 1,200-sow operation purchases replacements to improve genetics for international export markets, while a 10-sow show pig operation normally purchases replacements for offspring to compete in a national show ring. Do both of these operations have equal health risks in introducing foreign livestock? Accord-

ing to Rodibaugh, the answer is yes.

“Both would have issues at stake,” Rodibaugh suggests. “I think it can be an equal risk, it is just that maybe the show pig guy normally accepts a little more risk than the 1,200-sow guy.” Rodibaugh says. “If you look at total dollars, there is no question there. The larger the herd, the more total dollars at risk.”

No matter if it is a commercial-type firm or a show pig operation, introducing foreign animals as replacements is a threat to the base herd. But because there is such a drive to improve genetics through purchasing, swine health specialists like Rodibaugh and Dr. Tom Gillespie, veterinarian at Rensselaer Swine Services, in Rensselaer, Ind., have prepared biosecurity plans that include isolation and acclimation of newly purchased gilts.

Gillespie outlined three scenarios to safely introduce purchased gilts into a previously established confinement operation.

Scenario One is purchasing gilts at 150 to 180 days of age and using a longer acclimation period before introduction. These gilts should be kept in quarantine for a minimum of 42 days. Eighty days after the first of several groups has been integrated into the base herd, the isolation location should be empty and ready for sanitation.

Scenario Two suggests purchasing gilts and developing them in an on- or off-site gilt development unit (GDU) that acts as a nursery and finisher combination. Gilts housed in a GDU will be slowly acclimated to the base herd using introduc-

tion to onsite females and fecal exposure.

Scenario Three includes purchasing weanlings and putting them directly into the nursery. Weanling pigs introduced to the herd should be isolated in a low capital building for two to three weeks to prevent the entrance of pathogens into the nursery. Purchasing replacements at a younger age has become the trend.

Similar to Gillespie’s third scenario, Rodibaugh also suggests weanlings be isolated a short period of time, especially when the major concern is PRRS.

“What we are concerned about from an isolation standpoint would be primarily anything that those gilts were exposed to just as they left the farm or in transit,” Rodibaugh says. “So we would test them fairly quickly within maybe 10 days of arrival to make sure that they in fact are negative, and then we are clinically observing them for any other disease.”

Rodibaugh and Gillespie are satisfied with the success of each health plan.

“We have all three (isolation/acclimation) programs in my practice, and it is amazing to see how well they are working,” Gillespie says. “I tell my clients, ‘Monitor, monitor, monitor.’ There is an amazing amount of time to be spent monitoring a herd health program.”

Both veterinarians agree that with a properly managed health plan, purchasing gilts from outside sources can enhance an enterprise.

## Ruling on closed versus open

There is no clear answer as to which

type of operation is the best. If you chose a closed herd, health will not necessarily soar while genetic improvement fails, and if an open operation is selected, genetic improvement isn’t guaranteed to prevail while health deteriorates. It is an inventory of tradeoffs. Those tradeoffs are based upon the producer’s goals that, with the help of a veterinarian, can be achieved through either system.

As a vet, Gillespie’s focus is on herd health, “I want as good of health as I can achieve because that makes owners the most money. It comes back to working through the steps with the owner and just having the discussion (about goals).”

Rodibaugh agrees.

“You can make any system work, it is just thinking through how you can minimize your risk of disease, while at the same time maximizing your genetic improvement. It’s a balance,” he says.

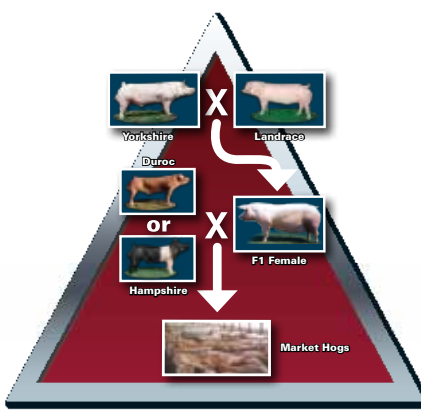
The balance is what allows producers to make a decision and to capitalize on it.

As for Forkner and TruLine Genetics, closing the herd not only improved the firm’s herd health status and increased its immunity; it has also given Forkner the opportunity to achieve a premium on non-breeding stock by cornering a niche.

“I think that herd health is such a tremendously important issue now days. Closing our herd has brought us, and continues to give us stable herd health,” Forkner says. “It has not been easy – it has been challenging, but it can be done.”



## The terminal system: A completely closed herd



- Greater than 95 percent of closed herds use a “within herd great-grandparent” breeding program, also commonly called a terminal system.
- The great-grandparent program begins with an initial purchase of a small number of maternal females. These females are mated to sires of a separate maternal line to produce F1 parent females. Landrace females can be mated to Yorkshire boars, or Yorkshire females can be mated with Landrace boars. This will maintain Yorkshire x Landrace dams as parent stock.
- The parent females are then mated to terminal boars to achieve heterosis in the terminal offspring. To gain the most heterosis, the boar must not contain any of the female’s breed composition (Yorkshire or Landrace). Thus, semen from a Duroc or Hampshire boar would be ideal.
- With this process, it is not necessary to introduce outside replacements. A percentage of purebred maternal females needs to be bred to maintain the purebred status of the great-grandparent stock, who then produce F1 parents that become the terminal market hog manufacturers. Semen is the only risk factor for disease introduction.