

MU Guide

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Purchasing a Herd Boar for Commercial Swine Production

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Introduction

Success in commercial swine production is determined by a pork producer's ability to use resources efficiently. However, the level of efficiency that can be obtained is set by the genetic merit of the breeding herd. The genetic merit of the breeding herd is established by the crossbreeding program used and the introduction of new seedstock either by purchasing females or boars.

The most popular crossbreeding programs have been rotational programs that produce replacement females so that only boars need to be brought into the herd. Farmers can use other more specialized crossbreeding programs, only purchase boars as well. See M.U. Guide G-2311 Terminal and Rotational Crossbreeding Systems for Pork Producers.

When purchasing new herd boars, follow a specific plan to ensure a trouble-free experience that will add genetically superior animals to your herd. The purchasing plan should include these steps:

- Identify your needs.
- Identify potential suppliers.
- Select the boars.
- Negotiate the sale.
- Introduce the boar to the farm.

Needs Assessment

First, you should determine which breeds of boars are needed, how many per breed and the date they should be in place. A critical step for a successful breeding program is the correct operation of the crossbreeding program. If the crossbreeding program is conducted



Top-gainer: Boar 11-3 was the top indexing boar at the 113th sale at the M.U. Swine Test Station. He indexed over 152 and his average daily gains ran 2.7 pounds per day. His average backfat thickness was 0.86 inches, and his pen-feed efficiency was 2.4 pounds of feed per pound of gain.

improperly, serious losses (up to \$40-\$50 per litter) will occur. Consequently, boars from each breed used in the crossbreeding program need to be maintained on the farm.

The next step in the needs assessment process is to determine the function of the boar's offspring. Use boars from sows with outstanding maternal characteristics if your highest need is to produce replacement gilts. Look for boars that excel for growth and carcass traits to sire market offspring. If you need boars to do both — produce replacement gilts and market pigs in a rotational program — then the boars should be from sows that are average or better for maternal characteristics, and the boars themselves should be average or better for growth and leanness.

Even if the priority for boars is to produce replacement gilts or to fulfill a dual purpose role, you still need to consider growth and carcass traits, because the major-

ity of the offspring from these boars will be sold as market pigs. That means growth and carcass traits will influence profit.

Identifying a Seedstock Supplier

Identifying the breeds needed and the roles they will serve makes selecting seedstock suppliers simpler. Find suppliers that have the breeds you need, then assess:

- their reputation;
- the health status of their herd;
- the performance program they use.

Evaluating a seedstock supplier's reputation can be difficult. Contact recent clients and find out if they were satisfied. You should also ask other pork producers, local agribusiness personnel and extension specialists about the supplier's past history, previous business experiences, etc. to try to develop an indication of business integrity.

You must have an accurate account of herd health to succeed. When selecting a supplier, you need to evaluate how well they can provide health security and reduced risk from genetic defects. Develop a list of health related questions for seedstock producers to answer. For example:

- What vaccination schedules do they use and why?
- Have there been any recent disease outbreaks? If so, what treatment programs did they use?
- Do they routinely use feed or water antibiotics and why?

- What are the results of recent slaughter checks?

Also ask for the name and telephone number of the herd veterinarian so any questions concerning herd health or disease status can be directed to that person.

Determine how frequently common genetic defects occur and how the supplier eliminates them. This will help guard against any "health surprises" that could rob profitability.

When evaluating seedstock suppliers, determine how committed they are to performance testing. The seedstock swine industry does not make full use of available genetic evaluation programs, so you will need to find out how much performance data they do collect and how extensively it is used. Questions to ask include:

- Are sow productivity data collected on all sows that farrow or only a portion of the sow herd or only during certain times of the year?
- Are the majority of the boars and gilts being tested for growth and backfat or just boars that may be sold?
- Are boars routinely consigned to central test stations?

Seedstock producers who do not routinely collect performance data on sows or who just evaluate the boars they may be able to sell are usually not committed to performance testing and probably are not making predictable progress. These breeders may not be able to

supply seedstock that will improve your efficiency and profitability.

The importance of a well-run performance breeding program should not be taken lightly. For example, Table 1 shows an evaluation of the performance of a boar tested at the University of Missouri Swine Test Station. Boar A was better than average for average daily gain, feed efficiency and average backfat thickness. His progeny should be better than average for those traits and make \$.90/pig more profit than pigs from an average boar. If Boar A sires 500 pigs he is worth \$450 ($500 \times \$.90 = \450) more than the average boar.

His worth will be greater if daughters are retained in the herd. The only way commercial pork producers can continue to genetically increase production efficiency and profitability is to purchase replacement seedstock from producers who are making predictable genetic progress. A well thought out, well run performance program by your seedstock supplier is necessary for this to occur.

The improvement you make in the future will parallel that of your seedstock supplier (Fig. 1). If your seedstock supplier is making little or no genetic progress, your only genetic boost will be from crossbreeding. You will remain static except for any improvements you make in management. It becomes imperative that you as a commercial pork producer accurately assess your seedstock producer's genetic improvement program, because your genetic future depends on it.

Choosing the Boars

After identifying your supplier you still must decide on individual boars. There is much variation on most farms and potentially a tremendous amount of information to look through. Traits of economic importance can usually be classified as maternal, postweaning or feedlot traits, carcass merit and soundness traits.

Maternal traits are those expressed by the sow after she has matured. Traits such as age at puberty, litter size, litter weight, and days to postweaning estrus are examples of maternal traits. These traits are lowly to moderately inheritable (Table 2), which makes it more difficult to make rapid genetic progress in these areas. This fact does not decrease their economic importance or their need in performance programs. Selection programs that evaluate maternal traits should include number born alive and litter weight at 21 days. These traits should be measured on every female that farrows.

Postweaning or feedlot traits usually include: days to 230 pounds, average daily gain, feed efficiency and backfat thickness measured with a ruler probe or ultrasound. These traits are moderately inheritable (Table 2), and you can expect reasonable progress when these traits are included in a selection program. On-farm performance programs should include days to 230 pounds and average backfat thickness. Average daily gain is difficult to measure uniformly in most produc-

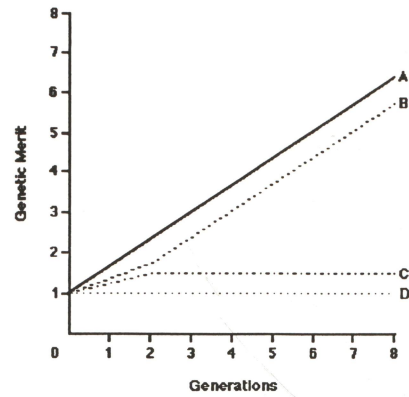
Table 1. Economic Value of Boars

	Average Daily Gain (lbs/day)	Feed Efficiency (lbs feed/lb gain)	Adjusted Backfat Thickness (in.)
Heritability	.4	.3	.4
Economic value/ Unit change	\$7.00/lb/da	\$13.00/lb FE	\$7.00/in
Boar A's			
Performance record		2.66	2.30
Group average	2.35	2.51	.71

Value of Boar A

Trait	Added Economic Superiority	Value	Heritability	Influence	Value	=	per pig
ADG	.31	.4	.5	\$7.00			\$.43
Feed Efficiency	-.21	.3	.5	-\$13.00			.41
Adjusted backfat thickness	-.04	.4	.5	-\$7.00			.06

Profit potential per pig .90
 Heritability values and economic value/unit change were taken from the Guidelines for Uniform Swine Improvement Programs (Weber, 1987).
 Each parent passes on one-half his/her genetic merit or influence to his/her progeny.



- A - Genetic merit of a seedstock supplier selecting top 15% of the boars and the top 40% of the gilts.
- B - Genetic merit of a commercial herd buying high ranking boars from Herd A.
- C - Genetic merit of a commercial herd buying above average boars from Herd D.
- D - Genetic merit of a seedstock supplier not making any genetic progress.
- A - Genetic merit of a seedstock supplier selecting top 15% of the boars and the top 40% of the gilts.

Figure 1: Genetic Merit

tion systems, and feed efficiency is difficult to estimate accurately.

On-farm performance programs that evaluate postweaning traits should include measurements on 70 percent or more of the healthy pigs weaned.

Carcass trait evaluation has traditionally required slaughter of the animal making it impossible to allow for direct selection for those traits. Advances in ultrasonic technology, however, make it possible to accurately measure loin muscle depth and size in the live animal. This will lead to the further development of lean growth and carcass quality programs.

Many performance traits are related genetically, and the genetic control of one trait may have some influence over other traits. This means that selection for only one trait may lead to good or bad results in another trait. For example, days to 230 pounds and backfat thickness have an unfavorable relationship. Pigs that are selected only for decreased days to 230 pounds will be fatter. You can, however, use an index that combines both traits into a score and select pigs that can grow fast and still be lean. Table 3 shows other traits and the magnitude of their genetic relationships.

Structural soundness and conformation are traits that have received much attention ever since the pork industry began using confinement facilities. Many breeds have improved dramatically in this area. When evaluating structural soundness, remember how you plan to use the offspring of a boar.

If all the offspring from a set of boars will be marketed (i.e. in a terminal program) then boars need to possess adequate feet and leg soundness for mating purposes.

If females will be retained in the herd from a new set of boars, then the boars may need to possess a greater degree of structural soundness to avoid structural problems with replacement gilts.

A good general rule is to avoid animals with obvious soundness problems. Pork producers should know to what degree of structural soundness they need for their facilities and to purchase boars accordingly — while also evaluating other performance traits.

Don't be influenced by current fads concerning structural soundness and conformation and don't forget to evaluate for other performance traits. This could lead to missed opportunities on purchasing seedstock that would improve efficiency and profitability.

So that your decision on which boars to buy won't be swayed by the way they look (their phenotype), start by studying the performance records. Select a group of boars that have the performance traits you need. Then, visually examine only that group. Select the top ranking individuals from the group that have acceptable soundness and phenotype.

Crossbred and Hybrid Boars

Many independent seedstock suppliers and commercial companies sell crossbred or hybrid boars. These boars are usually the result of crossing two or more breeds or lines. Research has documented that crossbred boars are more sexually aggressive. Conception rates can increase as much as 10 percent compared to purebred boars.

The progeny of crossbred boars are similar in performance to progeny of purebred boars, and research has found them to be of similar or even less variability.

Table 2. Heritability of Swine Production Traits

Trait	Heritability
Reproductive Traits	
Number born alive	.10
Prewearing survival	.02
Litter weight at 21 days	.15
Number weaned	.05
Age at puberty	.35
Growth Traits	
Average daily gain	.40
Days to 230 lbs	.35
Feed conversion	.30
Ultrasonic backfat thickness	.40
Carcass Traits	
Carcass length	.55
Loineye area	.50
Average backfat thickness	.45
Percent lean cuts	.35

When evaluating crossbred or hybrid boars, investigate their ancestry. Avoid crossbred boars from dams or sires that ranked in the lower half of the herd. Parents of crossbred boars should be of average or better genetic merit for the traits of interest.

Knowing the ancestry of crossbred boars will help keep you from hurting your program. Using crossbred boars in a rotational crossbreeding program will make the system more complex, when you are trying to maximize heterosis. Crossbred boars work well in terminal and rotaterminal systems, especially as terminal sires.

Negotiating Change of Ownership

The change of ownership process is often left to the preference of the seedstock supplier. However, terms of the change of ownership can be an important factor in your perception of the seedstock producer.

First you need to reach an agreement on sale price and what the sale price includes. For example, does the sale price include registration, transfer and delivery, or are there extra charges for these services?

Before you finalize the sale, you should agree on the guarantee and how the guarantee will work if unfortunate circumstances occur. In Missouri, all seedstock sales need to be accompanied by health certificates assuring the buyer that the herd is either accredited free of brucellosis and pseudorabies or that the appropriate

Table 3. Genetic Relationships Among Common Swine Production

	Traits				
	W	D	G	F	B
L ^a	+ ^b	+	0	+	0
W		0	0	+	0
D				++	—
G				++	—
F					+

Abbreviations are as follows:

- L^a = Number born alive;
- W = Litter weight at 21 days;
- D = Days to 230 lbs;
- G = Average daily gain;
- F = Feed conversion (feed/gain);
- B = Ultrasonic backfat thickness.
- +^b = Favorable relationship;
- = unfavorable relationship;
- 0 = no relationship.

blood tests will be performed within 30 days before change of ownership.

Introduction of the Boar to the Farm

Breeding swine purchased within the state of Missouri must originate from a herd that is shown to be free of brucellosis and pseudorabies or must be found negative by blood test for these two diseases within thirty days before the change of ownership.

Isolate your pigs for 30 days after change of ownership. During this time it would be advisable to conduct another blood test for brucellosis and pseudorabies.

Breeding swine purchased outside the state of Missouri must meet these same requirements (herd number and current herd test dates must be shown on the certificate of veterinary inspection). All breeding swine purchased outside Missouri must be isolated and quarantined for 30 days, and another blood test must be conducted for brucellosis and pseudorabies within those thirty days.

During the isolation period, market-age gilts, or small sows, that will be sold for slaughter can be penned near the boar, and the boar can be observed for sexual interest and libido. When the gilts achieve estrus, the boar can be mated to the gilts and observed for physical deformities of the penis. Allowing the first few services to happen under a controlled environment will make the experience more desirable for the boar and will probably lead to fewer breeding problems in the future.



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