

Babcock Genetics, Inc.
**Indexing and Selection:
A Positive Influence**

The benefits from genetic improvement in a commercial farm are very important to producer profit. The methods by which genetic improvement is attained may be overlooked in many commercial situations, resulting in reduced improvement at the commercial level. Increasing replacement rates within a herd is only one way to maximize genetic improvement. Increasing replacement rates in a commercial herd brings that herd closer to the level of its genetic source, therefore decreasing genetic lag (Table 1). Another method for attaining maximum genetic improvement in a herd is the performance indexing of replacement females.

Performance-indexed gilt selection is a very useful tool for genetic improvement within a herd. An important, often overlooked concept is that market hogs receive half of their genetic potential from their dam. This makes the genetic merit of the dam equally as important as the terminal sire she is mated to. Through performance testing and subsequent indexing of the performance test results, replacement females are ranked on traits important to the production of efficient market hogs. The females already possess the maternal traits needed for maximum reproduction. Indexing allows the identification of which females will produce the most efficient market hogs as well.

Producers either are, or are not indexing their replacement gilts. Depending on which method they have chosen, it is a decision that will dramatically affect their herd's genetic improvement, and improvement in margin from or from not performance indexing their gilts.

When raising your own replacements, enough females are reared to allow for sufficient culling of poorer structured individuals prior to performance indexing. Performance indexing allows for culling of genetically inferior females based on performance testing results. The number of females indexed, and the number of females selected from those indexed, allows the producer to develop a "selection rate" strategy within his replacement herd of gilts (Table 2). Selecting half of the indexed females results in a 50% selection rate, and selecting all of the indexed females results in a 100% selection rate.

Continually bringing replacement gilts onto a farm from a genetics supplier does not give the same economic benefit to the producer as does producing and indexing your own replacement gilts. When replacement gilts are brought onto a farm, the producer only orders the amount he needs to keep up his replacement rate. These gilts are not indexed gilts, but are rather a group of maternal line females from whatever was available at the time of the order. Therefore, the gilts received are from a pool where 100% were selected and none were indexed.

The economic benefit to the producer from varying selection rates within his indexed replacement gilt herd is quite variable as well. Improvement in margin per market hog may vary by \$0.30 for every 10% increase/decrease in selection rate (depending on region). The most significant impact from selection rate is when replacement females are not indexed for economically important traits, resulting in 100% being selected (100% selection rate), and zero economic benefit per market hog.

Performance indexing of replacement females is required to take advantage of the genetic potential of your closed herd, and to ensure progress in the right direction for current and future genetic improvement.

The figures below are based on average Midwestern production costs, and do not include the genetic improvement contribution from the nucleus herd.

Table 1:
The Economic Impact of Your Annual Sow Herd Replacement Rate

Replacement Rate	Predicted Genetic Gain/Market Hog
0%	\$0.00
25%	\$0.06
30%	\$0.19
35%	\$0.33
40%	\$0.46
45%	\$0.59
50%	\$0.72
55%	\$0.86
60%	\$0.99
65%	\$1.12
70%	\$1.26

Table 2:
The Economic Impact of Replacement Gilt Selection Rate and Indexing

Selection Rate	Predicted Genetic Gain/Market Hog
100%	\$0.00
70%	\$1.42
65%	\$1.56
60%	\$1.71
55%	\$1.86
50%	\$2.01
45%	\$2.16
40%	\$2.31
35%	\$2.46
30%	\$2.61