University of Idaho
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Agricultural Experiment Station

Current Information Series No. 891

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JUN 17 1991

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How Much Is This Boar Worth?

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The genetic superiority or inferiority of a herd boar can have an immediate and a long-term effect on the profitability of the pork enterprise. In a genetic sense, the boar is one-half of the herd, and an individual boar can influence the performance of the herd for generations.

For example, after four generations, only 6.25 percent of the genes provided by the first generation sows will remain in the herd, the remainder of the herd's genes (93.75%) having come through the boars used in the subsequent generations. Consequently, as profit margins narrow, market weights increase and marketing programs address carcass merit, selection for high-performing replacement boars will become even more important.

Criteria for boar selection

Swine producers use a variety of criteria to select replacement breeding stock, particularly boars. Physical or type traits such as skeletal structure, feet and leg soundness, muscle volume, internal capacity and breed are some of the traits that help establish the value of a boar for most producers.

However, performance information such as sow productivity index, average daily gain or days to 230 pounds, average backfat thickness and feed efficiency often have a much larger impact on the profitability of the herd. Unfortunately, in the Northwest performance test information on potential replacement animals is not routinely measured. Consequently, producers rarely consider it when purchasing replacement boars.

The value of high performance boars — An example

An important question for producers is this: How much can I afford to spend for performance tested boars and how much is their performance worth? The following example demonstrates the economic value of performance differences between two boars tested for average daily gain (ADG), feed efficiency or pounds of feed per pound of gain (F/G) and average backfat thickness (BF). The example considers only the progeny produced by the boar in the current generation. It does not include the potential genetic contribution of the boar to the sow herd in subsequent generations.

Assumptions and economic values

Several assumptions must be made to allow comparison of boars that differ in performance level. The following assumptions were used throughout the example:

1. Boars average eight pigs marketed per litter sired.
2. ADG, F/G and BF are independent.
3. All pigs are marketed at 240 pounds.

The example considers no opportunity costs or discounting procedures.

Average daily gain

The following assumptions were used to establish an economic value for ADG:

1. Average non-feed costs are $.175/day.
2. Heritability of ADG = 0.4. Heritability is the genetic portion of the total variation in ADG.
3. An increase in ADG of 0.1 lb corresponds to a 6-day decrease in the number of days on feed.

Economic value of a 0.1 lb increase in ADG
= 6 days x $.175/day
= $1.05 ($10.50/pound).

If an average boar sires 40 litters, then a 0.1-lb increase in ADG translates into a profit of $67.20:

Profit = increase in ADG (0.1 lb)
x heritability of ADG (0.4)
x genetic contribution of boar to pigs (0.5)
x economic value of ADG ($10.50/lb)
x number of pigs sired (320)
= 0.1 x 0.4 x 0.5 x $10.50 x 320 = $67.20.

Consequently, a producer could afford to pay up to $67.20 for each 0.1-lb advantage in ADG possessed by the faster-growing boar of a pair of prospective replacement boars.

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Average backfat thickness

The following assumptions were used in establishing an economic value for BF:

1. Pigs are marketed using the National Pork Producers Council (NPPC) Lean Guide to Pork Value (1 percent premium for every 0.1-inch decrease in BF).
2. Base market price = $50.00/cwt.
3. Heritability of BF = 0.4. Heritability is the genetic portion of the total variation in BF.

Economic value of 0.1 inch of BF
= 240 lb x $50.00/cwt x 0.01 premium
= $1.20 ($12.00/inch).

If a boar sires an average of 40 litters, then a 0.1-inch decrease in BF translates into a $76.80 profit:

Profit = decrease in BF (0.1 inch)
x heritability of BF (0.4)
x genetic contribution of boar to pigs (0.5)
x economic value of BF ($12.00/inch)
x number of pigs sired (320)
= 0.1 x 0.4 x 0.5 x $12.00 x 320 = $76.80.

Consequently, a producer could afford to pay up to $76.80 for each 0.1-inch decrease in BF possessed by the leaner boar of a pair of prospective replacement boars.

Feed efficiency

The following assumptions were used to establish an economic value for feed efficiency or pounds of feed per pound of gain (F/G):

1. Feed cost per pound = $.071.
2. Heritability of F/G = 0.3. Heritability is the genetic portion of the total variation in F/G.
3. A decrease in F/G of 0.1 lb corresponds to an 18-lb decrease in feed consumed per pig.

Economic value of a 0.1 decrease in F/G
= 18 lb x $.071/lb
= $1.28 ($12.78/lb).

If a boar sires an average of 40 litters then a 0.1-lb decrease in F/G translates into a $61.34 profit:

Profit = decrease in F/G (0.1 lb)
x heritability of F/G (0.3)
x genetic contribution of boar to pigs (0.5)
x economic value of F/G ($12.78/lb)
x number of pigs sired (320)
= 0.1 x 0.3 x 0.5 x $12.78 x 320 = $61.34.

Consequently, a producer could afford to pay up to $61.34 for each 0.1 lb decrease in F/G possessed by the more efficient boar of a pair of replacement boars.

Combined traits

The previous examples illustrate the value of a 0.1-unit increase in performance of boars siring 40 litters or 320 pigs in their lifetimes. Table 1 shows the economic value of a 0.1-unit advantage in ADG, BF and F/G for boars siring 20 to 60 litters in their lifetimes.

Table 1. Economic value of a 0.1 unit advantage in ADG, BF and F/G.

No. litters[1]	ADG	BF	F/G	All
20	$ 33.60	$ 38.40	$30.67	$102.67
30	50.40	57.60	46.00	154.00
40	67.20	76.80	61.34	205.34
50	84.00	96.00	76.68	256.68
60	100.80	115.20	92.01	308.01

[1]Eight pigs marketed per litter sired.

Table 2. Relative value of two boars based on performance test differences for ADG, BF and F/G.

	ADG	BF	F/G
	(lb)	(inch)	(lb)
Boar A	2.60	0.70	2.20
Boar B	2.20	1.00	2.70
Difference	0.40	-0.30	-0.50

In many test groups or sale lots, dramatic differences in performance exist between boars of similar type and function. The boars in Table 2 are typical of many boars produced in the United States and show the value of performance test information.

Boar A was superior to Boar B for all three traits. Assuming 40 litters (320 pigs sired) boar A will generate $805.90 more profit than boar B based on these simple calculations of economic advantage:

ADG:	0.4 lb x $67.20/0.1 lb	=	$268.80
BF:	0.3 inch x $76.80/0.1 inch	=	$230.40
F/G:	0.5 lb x $61.34/0.1 lb	=	$306.70
Advantage		=	$805.90

This example does not include any potential advantages for future generations due to better genetics in the sow herd.

Summary

Pork producers can no longer afford to purchase replacement animals without performance information or to ignore performance differences between boars of comparable type and function. When the effects of improved performance are combined with breed complementarity in a commercial crossbreeding program, profits generated by boar selection will increase further. Commercial producers should purchase their breeding stock from reputable breeders implementing sound genetic improvement and/or performance testing programs.

Acknowledgments — The author thanks the following individuals for reviewing the manuscript: Gene Futrell, Extension livestock economist at Iowa State University; John Henry, Extension agricultural agent in Canyon County, Idaho; and Lyle Barton, pork producer, Paul, Idaho.

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300, April 1991

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