Are Tested Boars a Bargain: A Comparison of Relative Economic Values and Prices Paid for Centrally Tested Boars

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Three basic questions arise when one examines the prices paid at auctions for boars from central test stations. These questions are: 1) what is the relationship between the individual performance traits and the sale price? 2) are the relative economic values that buyers place on the individual traits different from those economic values used in the test station indexes and 3) are tested boars a bargain? Clearly, question three is of primary importance to producers, but questions one and two provide insight into the value and importance that buyers place on performance tested pigs.

This project has attempted to answer these three questions. Records from 4355 boars sold at auction from 1973-1978 at test stations at Ames, Ida Grove and Lisbon, Iowa, and Clarkson, Nebraska were included in this study. Only boars which sold at auction for more than the minimum sale price were included.

Average sale prices ranged from a high of $457 for Landrace to $340 for Berkshire. Durocs were best represented and their sale prices varied most. Sale prices also varied among test stations and were $491, $410, $431 and $313 for the stations at Ames, Ida Grove, Lisbon and Clarkson respectively. The high average sale price at Ames may be the result of it being the first of the central boar test stations established and it enjoying a nationwide reputation. Sale prices average $20 higher for spring farrowed pigs than for fall farrowed pigs reflecting the usual upswing in hog prices and a greater demand for boars to sire spring farrowed pigs.

The relationship between the performance traits and sale price was examined using multiple regression techniques. Each boar had a record which included days to 230 pounds, backfat, loin eye area, gain on test and feed efficiency (lb feed/lb gain). Performance information was available for buyers for decision making.

TABLE 1. RELATIONSHIP OF PERFORMANCE TRAITS WITH SALE PRICE

	Average Change in Sale Price Per Increase in:				
Breed	1 day days to 230 lbs	.1 in backfat	.1 in^2 loin eye	.1 lb gain	.1 lb F/G
Berkshire	NS[a]	NS	NS	NS	NS
Chester White	NS	-34.05	NS	18.90	-28.29
Duroc	-3.32	-48.48	7.90	38.17	-38.70
Hampshire	NS	-32.31	NS	46.50	-25.78
Landrace	NS	-30.63	8.62	32.78	-34.65
Poland China	NS	-151.10	NS	95.36	NS
Spotted	NS	-37.80	8.65	44.10	-36.40
Yorkshire	NS	-67.70	11.60	55.10	-53.40

[a]NS = not statistically significant

Table 1 contains estimates of what a change in one of these five traits would mean in sale price if all other traits remained constant. It appears that for Berkshires and Poland Chinas, few traits influence sale price. These results may not be totally valid, due to the small number of these boars for which there was sale price data. In general, we observe that holding all other traits constant and increasing backfat by 0.1 inch, results in a decrease in sale price of from $30 to $70. Likewise, a 0.1 pound per day increase in gain was worth between $19 to $55. Responses in feed efficiency (lb feed/lb gain) were similar in magnitude (but opposite in sign since lower values are more desirable) to those for gain. A slight suprise was that loin eye area did not affect sale price of Chesters or Hampshires. This result may suggest that buyers seeking boars of these breeds were not concerned with meatiness, but were emphasizing other traits. Days to 230 pounds was important only for Durocs. It seems that for the other breeds, days to 230 pounds added little or no extra information once the buyer knew the gain of a particular boar. These results differ from those of Neville et al. (1976) which indicated days to 230 pounds was more important than gain.

How much variation in sale price was accounted for by these traits? The amount of variation in sale price accounted for by the performance ranged from 21 percent in Spotted to 41 percent in Landrace. The other 59 percent to 79 percent was probably influenced by pedigree, conformation, soundness and herd of origin.

The second question posed at the beginning of this paper was how do the prices paid for boars compare with the values used in calculating the indexes used at test stations? Economic values suggested by NSIF (Hubbard, 1980) are in Table 2.

TABLE 2. RELATIVE ECONOMIC VALUES AND SALE PRICES FOR INDEX TRAITS

	Relative Economic Values[a]			
	NSIF	Iowa Index	All Sale Prices	Moderate Sale Price
Backfat				
Average Daily Gain	4.00	6.15	3.15	3.71
Feed Efficiency	-9.00	-5.48	-2.65	-2.62

[a]Values are set relative to a -3.50 dollar value for backfat

The largest economic value is placed on feed efficiency. The index used at Iowa test stations was calculated by Dr. Hazel and no economic values which were used to compute it were published. They were back calculated using the genotypic and phenotypic variances and covariances (Bereskin, 1977) used in the NSIF index and are listed in Table 2. Relative economic values for the backfat, gain and feed efficiency were then computed using all sale prices and only those sale

prices less than $1500. All sale prices were set relative to a -3.50 dollar value for backfat. Results indicate that the Iowa index places more weight on gain and less on feed efficiency than the NISF index. Buyers, however, place less emphasis on gain and much less on feed efficiency than do either of the indexes.

The final question which needs to be asked is are tested boars a bargain? The value of the traits can be estimated by examining what a 0.1 inch decrease in backfat, a 0.1 pound increase per day in gain and a 0.1 pound decrease in feed efficiency is worth. Calculations of those values are tricky, but the following formula outlines a possible way to do it:

$$\text{Value of a change in a trait} \times \text{heritability} \times \text{sire's contribution} \times \text{no. of pigs} = \text{profit}$$

Clearly the value of a change in a trait is most difficult to calculate. Let's assume for our calculations that a boar will sire 40 litters of eight pigs each.

For backfat, a reasonable assumption might be that a 0.1 inch of backfat is worth $.50 per cwt. of carcass per pig sold on a grade and yield basis. This translates to about $.81 per 230 pound market pig. If heritability is 50 percent and the boar sires 320 pigs, the profit is then $64.80 dollars (Table 3).

TABLE 3. COMPARISON OF SALE PRICES AND POSSIBLE PROFITS

Change in	All Sale Prices ($)	Moderate Sale Prices ($)[a]	Possible Profits ($)
.1 inch BF (decrease)	54.05	32.22	64.80
.1 lb ADG (increase)	48.58	34.11	46.08
.1 lb F/G (decrease)	40.99	24.12	77.28

[a]Sales over $1500 were excluded from this column

If a person assumes that 0.1 pound increase in gain per day reduces the days to market by five percent (6-7 days), this means that more pigs can be raised, labor and fixed costs reduced per pig and more profit realized. If we assume it takes .82 hours of labor to raise a pig at $5 per hour, a five percent savings in labor is worth $.21. If fixed costs are $5 a pig, a five percent savings is worth $.25. Let's also assume a producer needs to make $10 a pig to stay in business. This means about $.50 additional profit because five percent more pigs can be raised. This comes to $.96 per pig. Therefore, if heritability is 30 percent, and the boar sires 320 pigs, the profit is worth $46.08 (Table 3).

For feed efficiency, a 0.1 pound decrease in lb feed/lb gain saves 23 pounds of feed in a 230 pound pig. If feed costs $.07 a pound, this means that 0.1 pound decrease in feed efficiency is worth $1.61 per pig. If heritability is 30 percent, then with 320 pigs sired, the profit is $77.28.

These "profit" values were compared to the average sale price paid for changes in these three traits and are in Table 3. If we look only at those boars which sold for less than $1500, these represent quite a bargain for buyers. Even if we agreed that these calculated profits may have been overestimated, there is still room for plenty of profit.

These results suggest that performance traits influence sale price but not heavily. Buyers place less emphasis on feed efficiency and gain than do the indexes. This leads us to the final question which is who is correct - the buyer or the test station boards which assign the values to the indexes. If the index values are more nearly correct, then further educational effort must be made by organizations like NSIF to convince buyers of the relative importance of each trait. The value of the tested boar should also be stressed and it is for this reason I am pleased to speak at this meeting on this important topic.

LITERATURE CITED

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