



CUTTING EDGE

Second Quarter 2007



Looking for maximum value at least cost?

Don't forget the sow contributes half the genes of each market pig.

There is a perception in at least part of the pork industry that the sow (and the maternal line from which she is derived) only impacts reproductive and maternal traits such as litter size and weaning weight, while the sire line influences only growth rate, feed conversion, and carcass quality. It is easy to see where this perception originated: An AI boar may influence 6,000 market pigs in his lifetime while a sow may only influence 40 to 60 market pigs during her productive lifetime. However, when viewed as a whole system, the maternal line contributes exactly 50% of the genes to the market pigs, just like the sire line does. Neither the maternal line nor the sire line influences the traits of biological and economic importance more than the other. Instead, they contribute equally. For this reason, pork producers, integrated companies and processors should explore and exploit the value of full-program genetics (not

just the sire line) to ensure they are maximizing their profitability.

PIC Selection Objectives

Grow-finish performance consisting of selection for improved growth and feed conversion along with carcass leanness, have always been important in PIC's selection objectives in the Camborough female. Figure 1 illustrates how PIC selection criteria has become more specific to meet industry demands. For 45 years, PIC has continuously used quantitative genetic selection in its maternal lines to improve grow-finish performance and carcass leanness of the commercial pig. Beginning in the 1990's, PIC began to incorporate lowly heritable traits such as total number born (heritability < 0.15). Technological advances have given the opportunity to include other traits such as sow robustness, feet and leg structure and meat quality.

In this issue of *Cutting Edge*, we attempt to describe yet another "fact of life" that is not necessarily fully acknowledged by some in our industry. This fact is the importance of maternal lines for maximizing carcass value at least cost. It is common biological knowledge that an offspring receives half of its genes from its mother and the other half from its father. This is true for all life forms involved in sexual reproduction. However, some of us tend to think that although half of the genes come from each parent, certain traits are influenced only by the genes from one parent. This issue of *Cutting Edge* positions the implications of the 50/50 inheritance of genes from the sire and dam, with special emphasis on what PIC is doing to ensure that full advantage of this biological phenomenon is exploited for the benefits of our customers in the pork supply chain.

PIC has simultaneously genetically improved reproductive and maternal performance of its maternal lines while continuing to improve growth rate, feed conversion, carcass leanness and meat quality of the commercial pig.

Please direct your questions and comments to Dr. A. Sosnicki, B. Fields, S. Jungst or A. Coates.

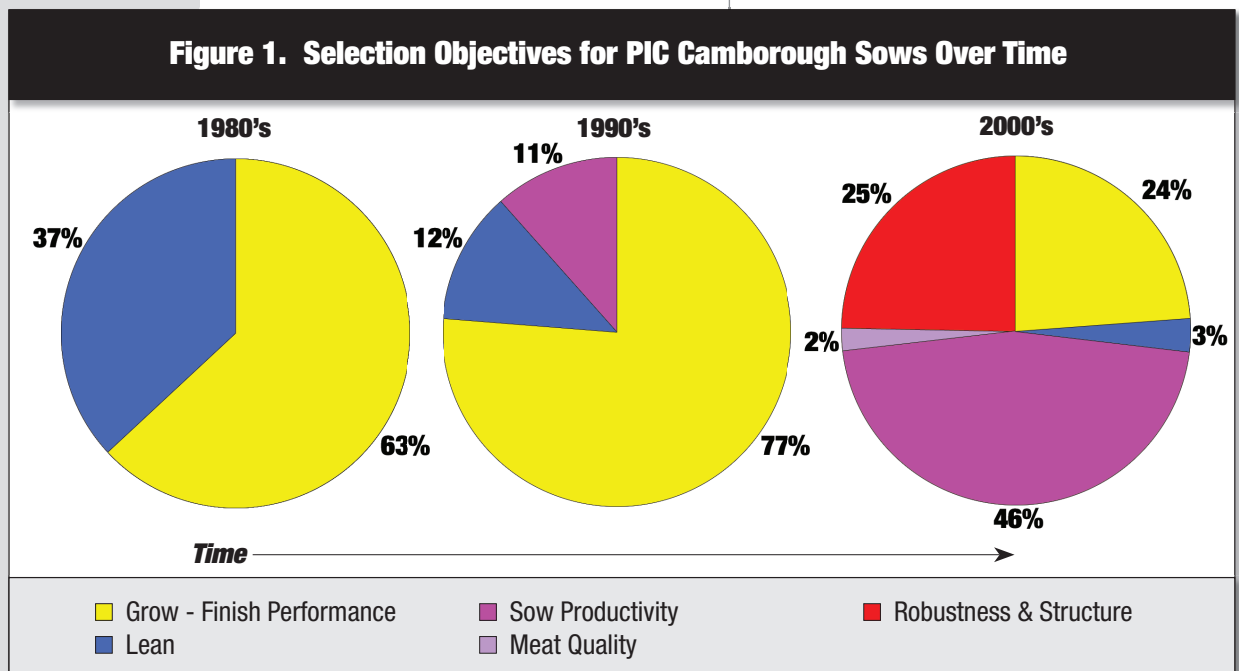
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Through the additional benefits of marker assisted BLUP (MA-BLUP) and our genetic nucleus (GN) crossbred progeny testing program, PIC has simultaneously improved reproductive and maternal performance of its maternal lines while continuing to improve growth rate, feed conversion, carcass leanness and meat quality of the commercial pig.

Currently, PIC has over 200,000 active pedigreed sows in GN and multiplication farms worldwide contributing data to

the maternal line genetic improvement program. This ensures that not only will PIC genetics continue to contribute to reducing on-farm costs of production, but they will also produce pigs with the lean content and meat quality desired by the pork processing industry. Although each product in the Camborough family of gilts has unique selection objectives that enable them to fit a wide variety of production systems, growth rate, feed conversion, and carcass and meat quality continue

Figure 1. Selection Objectives for PIC Camborough Sows Over Time



**Figure 2. PIC Dam Line Competitive Advantage
Deviations from Competitor Performance Adjusted to 105 Days in Finisher**

PIC and Competitor Line	ADG, lb. / day	Feed Conversion	Hot Carcass Wt., lb.	Backfat, mm	Loin Depth, mm	Lean ^g , %	Carcass Value ^g , \$	Loin pH
C22 vs. Competitor A ^c	+ .13 ^a	- .09 ^a	+ 15 ^a	+ 2.4 ^b	+ .1 ^a	-1.3 ^b	+ \$ 3.42 ^a	NA
C22 vs. Competitor B ^d	+ .21 ^a	- .18 ^a	+ 11 ^a	- .9 ^a	- .2 ^b	+ .5 ^a	+ \$ 2.84 ^a	+ .01 ^a
C22 vs. Competitor C ^e	+ .25 ^a	- .44 ^a	+ 25 ^a	- 8.9 ^a	+ 5.2 ^a	+ 5.5 ^a	+ \$11.89 ^a	+ .02 ^a
Camb. vs. Competitor D ^f	+ .14 ^a	- .19 ^a	+ 4 ^a	- 2.6 ^a	- 1.0 ^b	+ 1.4 ^a	+ \$3.11 ^a	+ .12 ^a

a PIC product performed better than competitor product.
 b Competitor product performed better than PIC product.
 c Number of observations: 380 C22 and 393 Competitor A carcasses.
 d Number of observations: 592 C22 and 634 Competitor B carcasses.

e Number of observations: 383 C22 and 382 Competitor C carcasses.
 f Number of observations: 1,110 Camborough and 778 Competitor D carcasses.
 g Carcass value was calculated assuming a base carcass price of \$ 57.00 / cwt. of hot carcass and a U.S. packer's payment grid.

to be important components of the genetic improvement program for each maternal line.

PIC Competitive Advantage

PIC actively tests the performance of its maternal line products against other breeding stock suppliers' female products. Based on the results from PIC validation trials and feedback from the industry, selection objectives of the pure lines can be adjusted to continuously provide maximum genetic value to the industry.

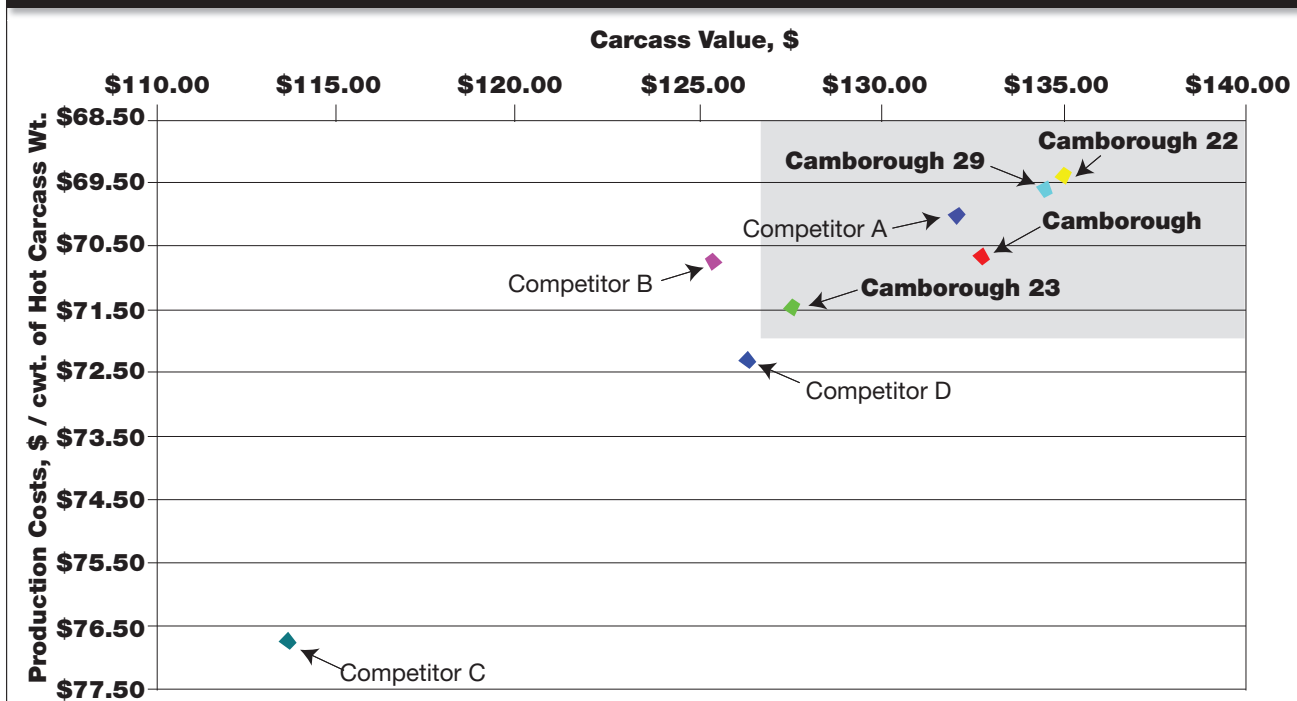
PIC uses by-product maternal barrows as a proxy for the contribution the sow makes to the performance of her progeny, and to demonstrate differences between PIC and competitor maternal lines. These commercially based trials place the pigs side-by-side in the same finishing

barn so they are compared under the same environmental conditions. Data on mortality, feed intake, growth rate and carcass and meat quality are routinely collected. The trait differences between the maternal lines can be divided by two, to reflect the actual difference between slaughter pigs from the two maternal lines. The results from four recent validation trials comparing PIC maternal line products against competitors are presented in Figure 2.

Figure 3 demonstrates that not only are PIC progeny more economical to produce, they deliver greater market value to the processing industry. PIC maternal line products are clustered in the upper right hand quadrant of the graph, indicating the highest carcass value and lowest costs to produce a cwt. of hot carcass.

Overall, competitor barrow trials have

Figure 3. Competitive Advantage of PIC Females
Feed Costs \$.10 / lb.

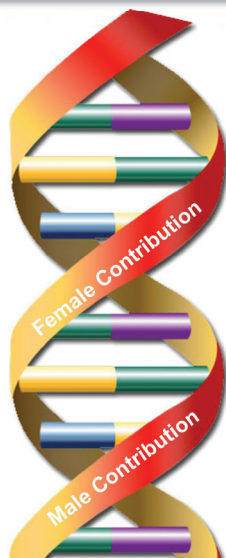


Assumptions: 60 lb. Entry wt. into finisher; 105 days in finisher;
Fixed costs = \$.12 / day in finisher; Feed costs = \$.10 / lb.
Base carcass price = \$ 57.00 / cwt. and U.S. Packer Payment Grid

**Figure 4. The PIC Full Program Advantage:
PIC Males & Females produce higher net margins through faster growth rates,
better feed conversions, superior carcass traits, and more pounds of quality pork**

**PIC Female Contribution
Growth & Carcass
Advantage / Pig**

Camborough® 22 vs Competitor A	\$ 1.13
Camborough® 22 vs Competitor B	\$2.87
Camborough® 22 vs Competitor C	\$9.29
Camborough® vs Competitor D	\$2.78



**PIC Sire Contribution
Growth & Carcass
Advantage / Pig**

PIC 327L vs Competitor A	\$3.45
PIC 280M vs Competitor A	\$2.52
PIC 337G vs Competitor C Line 1	\$8.32
PIC 337G vs Competitor C Line 2	\$7.01
PIC 337G vs Competitor D	\$4.55

shown that PIC female lines have an economic advantage of between \$1.13 and \$9.29 per market pig in

margins over the competition (Figure 4). Keep in mind that this is only measuring the 50% of genetics that come from the maternal lines! Add the PIC sire line advantages of between \$2.52 and \$8.32 per market pig and the results become even more clear. PIC can effectively deliver genetics that provide the industry with an advantage of up to a \$17.61 per market pig over the competition! Through PIC genetics, technology and services, our company is

positioned to continually contribute to the value creation process of the entire pork industry.

PIC

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