



Using EBVs to select replacement stock improves profitability.

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Selection for multiple traits

Selection strategies need to consider a number of traits that influence profitability of pig production. Estimated Breeding Values (EBVs) are available from within-herd genetic evaluations of each breeding company or from the across-herd genetic evaluation of the National Pig Improvement Program (NPIP). The problem of how much selection emphasis to place on each trait can be addressed by combining EBVs for traits in an economic index.

Two indexes are set up for the National Pig Improvement Program (NPIP)

Information on economic, production and marketing parameters is used in a profit function that weighs individual EBVs in accordance with their economic importance and combines them into a single \$Index value. Two indexes have been set up for the NPIP to reflect different selection strategies. The Terminal Sire line index places emphasis on backfat and growth rate. In contrast, the Maternal Line index places emphasis on litter size and growth rate. Both indexes express the economic worth of differences in EBVs on a per litter basis.

Three AI boars – Large differences in EBVs

EBVs from the across herd analysis of the NPIP for three AI boars are shown in Table 1 along with the Terminal Sire Line and Maternal Line index of each boar. This information shows that

- o *All boars have positive EBVs for growth rate and are genetically superior to the base year of 1991. Boar A has the highest EBV for growth rate (+73 g) followed by Boar C (+62 g) and by Boar B (+10 g).*
- o *All boars have negative EBVs for backfat. Boar B is an extreme boar with a very good EBV for backfat (-6.1 mm). The EBV for Boar A is -2.6 mm and the EBV for Boar C is -1.8 mm.*
- o *Boar B has a negative EBV for litter size and is therefore genetically inferior to the base for this trait. Boar C is the best boar for litter size (EBV: +1.8 piglets / litter) followed by Boar A (EBV: + 0.5 piglets / litter)*

Three AI boars – which one is the best?

None of these boars is superior in all three traits and producers need to combine individual EBVs into an index to determine which boar has the highest economic benefit for their herd. The two indexes set up for the NPIP rank the three boars in the following order:

Terminal Sire line \$Index: Boar B is the best boar with an index value of +146 \$/litter, because of its extremely low backfat EBV, followed by Boar A (+112 \$/litter).

Maternal Line \$Index: Boar C is the best maternal line boar (+95 \$/litter), because of its good litter size and growth rate EBVs, followed by Boar A (+70 \$/litter). The poor EBV for litter size and growth rate result in a low maternal line index for Boar B (+26 \$/litter).

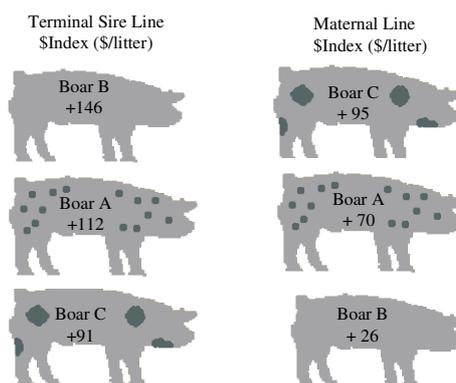


Table 1. EBVs for growth rate, backfat and litter size along with the Terminal Sire Line index (TS\$Index) and Maternal Line index (M\$Index) for three Large White AI boars.

	EBV growth rate (grams)	EBV backfat (mm)	EBV litter size (piglet)	TS\$Index (\$ / litter)	M\$Index (\$/litter)
Boar A	+73	-2.6	+0.5	112	70
Boar B	+10	-6.1	-0.4	146	26
Boar C	+62	-1.8	+1.8	91	95

Please note: EBVs may change when more data is added. Date of analysis: 05/05/2003. See NPIP web pages for latest information on EBVs; <http://npip.une.edu.au>.

Boars with better EBVs increase profit in your herd

Pigs receive half of their genes from their sire and half from their dams. Therefore, on average half of the differences in EBVs between boars will be realised by their progeny on farm. Based on the Terminal Sire Line index the expected increase in profit is:

- + 27.5 \$ / litter if Boar B is chosen over Boar C
- + 17.0 \$ / litter if Boar B is chosen over Boar A
- + 10.5 \$ / litter if Boar A is chosen over Boar C

Expected differences in profitability range from 34.5 \$/litter (Boar C versus Boar B) to 12.5 \$/litter (Boar C versus Boar A) for the Maternal Line Index.

Main messages:

- Differences in EBVs between boars are large
- Profitability is increased in your herd by choosing genetically superior boars
- Producers should use information on EBVs when selecting replacement stock



Producer 3