

# The Genetic Merit of A.I. Sires Versus Herd Bulls

By Steve Schnell  
Vice President, Dairy Cattle Genetics

Each sire summary, USDA-AIPL\* produces genetic evaluations on all identified bulls in the system. This includes bulls from artificial insemination (A.I.) companies plus natural service bulls with 10 or more properly identified daughters in the DHI (Dairy Herd Improvement) system. By looking at the summaries, we can get a feel for the difference in performance of the average A.I.-sired cow versus cows sired by a natural service bull.

The best comparison can be made by looking at bulls in both groups that just received their first genetic evaluation. For A.I., this means sires that were sampled three and one-half years ago. For natural service, it includes herd bulls used on farms approximately three and one-half years ago. The three and one-half years represents the time for daughters of the sires to be born, bred, calve and begin producing milk.

Table 1, represents the effect of one generation of average A.I. sires versus herd bulls. On a Lifetime Net Merit (LNM\$) basis, the difference is \$121. The daughter of an A.I. sire is expected to earn \$121 more over her lifetime than a daughter of a natural service sire. Apply this to a herd of 100 cows. By having chosen an A.I. sire for each of the 100 cows, profits are expected to be \$12,100 more than if the cows had been sired by a herd bull.

Table 1. **Average genetic evaluations of first proof sires.**

	<b>Milk</b>	<b>Fat</b>	<b>Protein</b>	<b>LNM</b>
A.I. Sired Bulls	+894 lb	+30 lb	+28 lb	+\$190
Natural Service Bulls	+56 lb	+4 lb	+4 lb	+\$69
Difference	+838 lb	+26 lb	+24 lb	+\$121

Genetics are cumulative. If you have been using a herd bull for multiple generations the differences between the second generation animals of A.I. versus natural service offspring is greater than the first generation. This difference increases as more generations add up.

Table 2, looks at the expected difference in milk production and LNM\$ after using an average A.I. sire rather than a herd bull for one, two and three generations. These calculations assume both groups start with an average cow and that genetic progress per generation is +200 pounds milk and +\$90 LNM.

Table 2. **Additional performance of generational use of average A.I.-sired cattle versus herd bulls.**

<b>Generation</b>	<b>Milk</b>	<b>LNM</b>
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Generation One	+838	+\$121
Generation Two	+1257	+\$181
Generation Three	+1467	+\$212

With the use of 80th percentile or higher LNM sires the advantage of A.I. versus natural service bulls after three generations more than doubles the advantage seen in Table 2.

The bottom line is the advantages of A.I. are well documented. Besides the benefits of enhanced conception ability, safer working conditions, reduced insurance and higher milk checks, A.I. leads to superior genetics and more overall profitability.

\*United States Department of Agriculture -Animal Improvement Programs Laboratory