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Genetic Decisions for Today? Or Tomorrow?

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The dairy heifers which are calving in dairy producers herds today are the product of decisions made when their dams were bred. The genetic capabilities of those heifers were determined by the genetic material they inherited from their sire and dam when the sperm from their sire fertilized the egg from their dam. The choice of that sire and that dam was a genetic decision made almost 3 years ago. If a dairy producer is to have any control over the genetic merit of future herd replacements in the dairy herd then it will depend on the genetic merit of the sire and the dam of each replacement.

Information on the genetic merit of bulls or cows is available from USDA if the bull is owned by an artificial insemination (AI) business or is registered in a breed organization herdbook and the cow is enrolled in the Dairy Herd Improvement (DHI) program and has a sire which meets the criteria just given for bulls. Dairy producers have two groups of bulls to choose from as potential sires of herd replacements – bulls with semen available from an AI business or young bulls from their own or another dairy producer's herd which would be used as natural service bulls or non–AI bulls. The dams of heifer replacements will generally be cows in their herd. Heifer replacements may be purchased from outside the herd but genetic information on their sires and dams will only be available if the sire and dam are identified and meet the criteria listed previously.

In the sire and cow genetic evaluation summary published three times each year beginning in 2008 by USDA (http://aipl.arsusda.gov/eval.htm), summary information is available to compare the two groups of bulls from which a dairy producer might choose potential sires of herd replacements. Predicted transmitting ability (PTA) is the measure of the genetic merit an animal passes to its offspring which is used in the summary.

Results from the recent summary are given in Table 1. There were striking differences between the AI and Non-AI bulls. The average active AI bull had $167 higher PTA for the Lifetime Net Merit $ index (NM$) than the average Non-AI bull born in the last 8 years. The average of first evaluation AI bulls was $90 higher in NM$ than the average of first evaluation Non-AI bulls. The active AI bulls on average had higher genetic merit for several component traits in the NM$ index including higher fat and protein yield, lower somatic cell score and longer productive life and were equivalent for daughter pregnancy rate.

While all cows in the dairy herd are potential dams of herd replacements, if there are sufficient replacements, they should be kept from the dams with the highest genetic values for NM$. Choices today of the sires and dams of produce herd replacements are decisions for the genetic future of the herd and won't be realized until about three years from now.

Table 1. Average PTA of bulls evaluated in August, 2007.

Bull Group	PTA Values						
	Milk	Fat	Protein	Somatic Cell Count	Productive Life	Daughter Pregnancy Rate	NM$
Active AI Holsteins	+838	+32	+25	2.94	+1.1	-0.4	+242
AI Holsteins Born in Last 8 Years	+695	+25	+23	3.00	-0.3	-0.9	+136
Non-AI Bulls Born in Last 8 Years	+129	+7	+6	2.98	+0.6	-0.3	+75
First Evaluation AI Holsteins	+897	+28	+26	3.03	-0.2	-0.8	+172
First Evaluation Non-AI Bulls	+141	+8	+6	2.97	+0.6	-0.3	+82