

Ten Minnesota Dairies Enrolled in Crossbreeding Study

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The University of Minnesota has initiated a crossbreeding study including more than 10,000 dairy cows over an 8-year period in 10 commercial dairies in Minnesota. The project will compare pure Holsteins to crossbreds in a 3-breed rotational system using the Holstein, Montbeliarde, and Swedish Red breeds.

The objective of the study is to compare the profitability of crossbred dairy cattle with pure Holsteins, which currently comprise more than 90% of the dairy cows in the U.S. Only pure Holsteins will be initially enrolled in the project as foundation cattle, and 4185 heifers and cows have been committed to the study across the 10 dairies. Approximately 40% of the foundation pure Holsteins will continue to be bred to Holstein A.I. bulls in successive generations across the years of the study. The other roughly 60% of the foundation heifers and cows will be mated to Montbeliarde or Swedish Red AI bulls – exactly one half to bulls from each of the two European breeds.

The 10 dairies are located throughout Minnesota and among the top managed dairies in Minnesota. All dairies have milked some crossbred cows with great satisfaction, and their success with the crossbred cows in their dairies has sparked the interest of the owners/managers to participate in the project. The 10 dairies range in size from 250 to 1620 cows.

These dairies are among the best in Minnesota for production and reproductive management (see table that follows). However, collectively, these dairies are near the Minnesota average for stillbirth rate, death rate, and turnover rate – all three of which have a huge impact on profitability of dairying.

So why are top dairies such as these interested in crossbreeding? After all, most are quite satisfied with their current performance for production and reproduction. However, the owners/managers of these dairies believe their current performance for calving difficulty, stillbirth, health disorders, death of cows, and survival of cows could use substantial improvement to boost profitability. Also, many of these dairies achieve superior production and reproduction at great expense in labor and other inputs. Crossbreeding provides a breeding system that should result in reduced labor requirements and less treatment of individual cows for health disorders.

Crossbreeding in dairy cattle has gained the interest of commercial dairy producers world-wide because of heterosis (also called hybrid vigor), which is the advantage expressed for many traits above the average of the parent breeds when animals of different breeds are crossed. Although most livestock industries have used crossbreeding for decades, dairy producers are now turning to crossbreeding. Over the

past 20 years, increasing deficiencies in fertility, health, and survival of pure Holsteins have resulted from selection against body condition and for larger body size, in addition to heavy selection for milk production. Besides this, inbreeding continues to mount in the global Holstein breed, and inbreeding has been documented to reduce the fertility and health of all farm animals.

This research is a follow-up to a continuing field study with 7 cooperating dairies in California, which compared pure Holsteins and crossbreds of Holstein with Normande, Montbeliarde, and Scandinavian Red. The California study ignored data for health traits, which will be emphasized in the new study. The new Minnesota study is likely to confirm results from the California study, which showed major advantages of crossbreds compared to pure Holsteins for calving difficulty, stillbirth, fertility, and survival, with a very modest loss of milk production.

This study is funded by grants from five internationally recognized breeding organizations, including Coopex Montbeliarde, France; Viking Genetics, Denmark and Sweden; Creative Genetics of California; Minnesota Select Sires; and Select Sires, Inc., Ohio. Professor Les Hansen and Junior Scientist Amy Hazel initiated the study from April to September 2008 in the 10 cooperating dairies.

Average number of cows, production, somatic cell count, fertility, stillbirth rate, death rate, and turnover rate for the 10 dairies in the crossbreeding study at initiation.

Trait	Average of dairies	Standard deviation
Number of cows per dairy	677	382
Milk (lb)	27178 (12328 kg)	2220 (1007 kg)
Fat (lb)	985 (447 kg)	95 (43 kg)
Protein (lb)	822 (373 kg)	68 (31 kg)
Somatic cell count (in 1,000's)	289	92
Days open (days)	137	10.8
Services per conception	2.6	0.17
Calving interval (months)	13.7	0.35
Stillbirth rate (%)	9.2	4.16
Death rate (%)	8.6	1.51
Turnover rate (%)	35	8.4