

CROSSBREEDING 103

A FURTHER UPDATE ON CROSSBREEDING RESULTS

Additional data from performance of crossbred animals in later lactations as well as early information on the first three-way crosses from the California dairies are now available. These dairies have provided data since mid-2002 to the University of Minnesota for analysis. The data gathered by these herds has now become fairly substantial and provides a useful indication of what can be expected when using these European dairy breeds in crossbreeding programs.

Purebred Holsteins had significantly higher production than any of the crosses. In first lactation, the Holsteins produced nine percent more combined fat and protein than the Normande crosses, five percent more than the Montbeliarde crosses and three percent more than the Scandinavian Red crosses. The production advantage for Holsteins increased as the cows advanced into later lactations. In second lactation, the Holsteins produced 12 percent more than the Normande crosses, seven percent more than the Montbeliarde crosses and six percent more than the Scandinavian Red crosses. This advantage was maintained in the third lactation as well. The Scandinavian Red and the Montbeliarde crosses produced more than the Normande crosses.

But, production is not the only factor affecting profitability. The number of live calves produced, how quickly cows breed back, the ability to avoid the sick pen and the length of productive life are also key factors leading to profitability. Table 2 summarizes the results of crossbreds for the fitness traits. The first-generation crosses all showed some advantage over Holsteins in the fitness traits. The Scandinavian Red crosses did quite well for calving ease and had the lowest level of stillbirths. The Montbeliarde crosses had among the lowest number of days open and had the highest rate of survival through first lactation.

The European dairy breeds used in

these herds likely have some genetic advantage for the fitness traits listed in Table 2. But, it's also important to recognize that heterosis is a key reason why the crossbred cows have an advantage in these traits. While heterosis has a positive impact on production, its biggest impact will be in

traits like stillbirths, fertility and general survival. The success of crossbreeding will be determined by the ability to maintain the benefits of heterosis over several generations of crosses.

Table 3 includes some early production information on second gen-

TABLE 1. YIELD BY LACTATION OF PURE HOLSTEINS AND FIRST GENERATION CROSSES IN SEVEN CALIFORNIA DAIRIES.

	Holstein	Normande x HO	Mont. x HO	Scand. Red x HO
NO. OF FIRST LACTATION COWS	380	245	494	328
NO. OF SECOND LACTATION COWS	285	204	381	243
NO. OF THIRD LACTATION COWS	111	109	104	72
FIRST LACTATION MILK*	21,801	18,926**	20,305**	20,499**
SECOND LACTATION MILK*	26,194	21,863**	23,547**	23,683**
THIRD LACTATION MILK*	26,966	22,667**	25,047**	24,766**
FIRST LACTATION FAT + PROTEIN*	1454	1322**	1388**	1411**
SECOND LACTATION FAT + PROTEIN*	1758	1540**	1637**	1656**
THIRD LACTATION FAT + PROTEIN*	1822	1589**	1727**	1710**

+ Actual 305-day yield in pounds with 2X milking.

* Statistically significant difference from pure Holsteins ($p < .05$).

** Statistically significant difference from pure Holsteins ($p < .01$).

TABLE 2. FITNESS TRAIT COMPARISONS OF PURE HOLSTEINS TO FIRST GENERATION CROSSES IN SEVEN CALIFORNIA DAIRIES

	Holstein	Normande x HO	Mont. x HO	Scand. Red x HO
BIRTH DIFFICULTY OF CALF BY BREED OF SIRE (1ST CALF)	16.4%		11.6%	5.5%
BIRTH DIFFICULTY OF CALF BY BREED OF SIRE (LATER CALVINGS)	8.4%	8.7%	5.4%	2.1%
CALVING DIFFICULTY BY BREED OF DAM (FIRST CALF)	17.7%	11.6%*	7.2%*	3.7%*
STILLBORN CALVES BY BREED OF SIRE (FIRST CALF)	15.1%	13.2%	12.7%	7.7%
STILLBORN CALVES BY BREED OF SIRE (LATER CALVINGS)	12.7%	7.3%*	5.0%*	4.7%*
STILLBIRTHS BY BREED OF DAM (FIRST CALF)	14.0%	9.9%	6.2%*	5.1%*
DAYS OPEN IN FIRST LACTATION	156	133**	137**	142**
SURVIVAL TO 305 DAYS IN FIRST LACTATION	86%	94%**	96%**	93%**

* Statistically significant difference from pure Holsteins ($p < .05$).

** Statistically significant difference from pure Holsteins ($p < .01$).

TABLE 3. FIRST LACTATION PRODUCTION OF THREE-WAY CROSSES IN SEVEN CALIFORNIA DAIRIES

THREE-BREED COMBINATION	No. of Cows	Milk*	Fat + Protein*
BROWN SWISS x MONTBELIARDE x HOLSTEIN	44	20,497	1435
MONTBELIARDE x SCANDINAVIAN RED x HOLSTEIN	43	20,857	1463
SCANDINAVIAN RED x NORMANDE x HOLSTEIN	86	19,421	1366

+ Actual 305-day yield in pounds with 2X milking.

eration crosses in these seven California herds. All these animals were three-breed crosses. These results indicate that the production levels in the three-way crosses is very similar to the first generation cross.

MORE RESULTS TO COME

Additional data on the fitness traits in the three-way crosses in the seven California dairies will be available in the future. Also several Universities have projects underway that will provide useful information about the value of Jerseys and Brown Swiss in crossbreeding programs. Select Sires will continue to provide routine updates with the latest crossbreeding information.

CROSSBREEDING PROGRAMS NEED TO BE WELL-PLANNED

Crossbreeding programs do not, by themselves, produce genetic improvement and need to be well organized to produce benefits. If you

decide that you want to give crossbreeding a try, the first step is to choose breeds that are competitive and have an ongoing and effective breed improvement program. The tried and true practice of using top AI sires is as vital in crossbreeding as it is in more traditional breeding programs. In fact, in these alternative breeds with smaller populations, using the very best proven bulls is even more important.

Capturing and sustaining heterosis is the third key part of an effective crossbreeding program. Select Sires recommends a three-breed rotation. A crossbreeding system using three breeds provides a good balance of maintaining heterosis in a manageable mating system. A two-breed approach will limit the long-term benefits of heterosis. A four-breed system will dilute the impact of Holstein genetics too much and makes the mating system very complex.

THE BOTTOM LINE

- ◆ Purebred Holsteins had higher production than first generation crosses to Normande, Montbeliarde and Scandinavian Red bulls.
- ◆ Crossbred cows performed better for fitness traits than the purebred Holsteins.
- ◆ Maintaining the benefits of heterosis in an ongoing crossbreeding program is a key factor to success.
- ◆ Producers that try crossbreeding should use a three-breed rotation.
- ◆ The breeds used should be competitive and have effective genetic improvement programs.
- ◆ Producers should use the best available AI sires from those breeds.

For further information about these breeds and their genetic evaluations, visit the breed Web sites listed below:

SWEDISH RED www.svenskavel.com
MONTBELIARDE www.coopex.com



Phone: (614) 873-4683 Fax: (614) 873-5751
www.selectsires.com