Genomics: Ushering in a Cattle Breeding Revolution

Following is continuation of the genomics article that was published in the July 2021 issue of the *Jersey Journal* beginning on page 18. Comments from four additional Jersey breeders provide insight on how they are using genotyping for herd management and marketing. Responses of six other breeders were published in the July magazine.

The Dairy Inc.
Lemoore, Calif.

2,000 Registered Jersey cows.
Genotyping Protocol: All heifer calves shortly after birth using Tissue Sampling Units (TSUs) and Ultra-low Density (ULD) chip from the AJCA and submitted to GeneSeek.

Ryan Mattingly and Bill Vander Poel began working together when Mattingly was hired to manage operations of Tule River Cattle Company Inc. (TRCC), a calf ranch owned by Vander Poel in Tulare County. The two became partners in The Dairy Inc. (TDI), a milking cow herd, in 2016. They established the herd with the purchase of xxxx Jersey cows and heifers, most with unknown sires and dams.

To determine ancestry and build pedigrees, Mattingly began genotyping newborn calves and the dams of the highest genomic heifers in early 2018. The practice was especially useful for identifying maternal grandsires so sounder mating choices could be made. It also enabled the dairy to bring unregistered cattle to Herd Register status more quickly because parentage could be verified.

Today, TDI is a fully registered herd and Mattingly uses genotyping primarily as a tool to manage heifer inventory. Each month, he predicts how many replacements will be needed in the milking string nine months out. To meet this need, an appropriate number of cows and heifers are bred to sexed Jersey bulls. The rest of the herd is bred to beef bulls. After calving, these cows are sold as dairy replacements and their calves for beef.

Mattingly uses Genomic Predicting Transmitting Abilities (GPTAs) to determine whether a dairy or beef service sire will be used. He analyzes Cheese Merit Dollars (CM$) primarily, but also yields for milk, fat and protein and tests for components. TDI is enrolled on REAP. The dairy has a 2020 herd average of 16,662 lbs. milk, 794 lbs. fat, 612 lbs. protein and 2,076 lbs. cheese yield, with herd average PTAs of +73 CM$ and +22 JPI. Nearly 40% of the heifers are P-level 7 or higher. Cows are milked in a double-20 parallel parlor and raised in open lots. Calves are raised at TRCC in Five Points, Calif.

Larry Martin
Tylertown, Miss.

100 Registered Jersey cows.
Genotyping Protocol: All heifer calves shortly after birth using TSUs and the ULD chip from the AJCA.

Sixteen years ago, Larry Martin began the journey to transition his Holstein herd to Jersey by breeding all females to Jersey bulls. He accomplished that goal about four years ago and today has his sights on a naturally polled herd that produces A2A2 milk.

To accomplish this and improve the genetic merit of the herd, particularly for Daughter Pregnancy Rate and Jersey Udder Index (JUI), he uses JerseyMate and genomic testing with the polled and beta casein add-ons. Martin has also bred the herd to polled bulls for many years and now uses homebred JX Martin-MS Valergo Victor 576 {5}-PP, GJPI +42, as a clean-up bull to grow the polled presence in the herd.

The practice has enabled Martin to break into a new cattle market for genetics. He recently consigned two heifers to the Southern Selection Sale hosted by Taylor Jersey Farm in Booneville, Miss. One of them is an early daughter of JX CDF JLS Pilgrim Thrasher {6}-ET, GJPI +126, from the "Maid" cow family that tested A2A2 and has a GJPI of +105. Martin also sells about 12-15 head through private treaty sales each year and has a strong market for local project calves.

The herd is enrolled on REAP. Cows are intensively grazed and milked in a double-six herringbone parlor.

Piedmont Jerseys
Lincolnton, N.C.

220 Registered Jersey cows.
Genotyping Protocol: About 25% of heifers shortly after birth using TSUs and the ULD chip from the AJCA and based on A2/A2 status.

Piedmont Jerseys is using genotyping a little differently than most dairy farms. Rather than genotyping for the full panel of traits, the dairy tests for beta casein A2 alone. Their long-term goal is to build a fully A2/A2 herd for cattle marketing and milk marketing purposes.

The Lutz family is in the final stages of building an on-farm creamery that will process fluid milk products and make ice cream from the Piedmont Jerseys herd. The Lutzes plan to bottle skim, 2%, whole and chocolate milk, buttermilk, heavy

Genomics

cream, half-and-half and eggnog and offer 24 varieties of ice cream—all made from A2/A2 milk.

Piemont Jerseys has been testing for the A2 beta casein gene for about 10 years and breeding to A2/A2 Jersey sires to transition to a fully A2/A2 herd. Animals that are known to be A2/A2 (A2/A2 dam and A2/A2 sire) are not tested. Animals with mixed parents are tested since matings of A1/A2 cows to A2/A2 bulls result in half A1/A2 progeny and half A2/A2 progeny. The Lutzes use PCDart to track whether a test is required or not.

Today, all but 10 older cows are A2/A2. These maternal lines will be phased out as the matriarchs leave the herd in the next year. In the meantime, milk from the A1/A2 cows is stored in a different bulk tank on the farm and sold to the milk cooperative.

Piedmont Jerseys is owned and operated by Corey and Bridgette Lutz and their children, James, Mandy and Olivia. Cows are housed in an open six-row freestall barn, milked in a double-eight herringbone parlor and intensively grazed. Silage, haylage, and baleage are raised on 300 acres.

The herd is enrolled on REAP and has an appraisal average of 83.9%, with 29 Excellent and 136 Very Good cows. Piedmont Jerseys ranks eighth in the nation for milk among herds with 150-299 cows with a 2020 lactation average of 21,224 lbs. milk, 965 lbs. fat and 740 lbs. protein.

Twin Star Dairy
Turlock, Calif.

1,000 Registered Jersey cows.
Genotyping Protocol: All heifer calves shortly after birth using TSUs and the ULD chip from the AJCA.

Twin Star Dairy has been genotyping the herd for the past four years. This and other herd management tools have helped herd owner Mike Miranda improve the genetic merit and performance of the herd. Miranda chooses bulls largely based on NM$, DPR, JUI and feet and legs.

Because they are typically more superior from a genetic standpoint, all heifers are bred to sexed Jersey semen. About 60% of the milking cows are bred to sexed Jersey bulls and the balance to beef bulls. Excess dairy replacements are sold primarily as fresh young cows, but as springers too on occasion.

The threshold for dairy versus beef service sires for milking cows is based on performance and an appraisal score of at least Very Good-81%. The appraisal minimum has steadily increased over the years (from Desirable-79% in 2016 to Very Good-81% in 2021) as herd average appraisal has improved along with udders, feet and legs and other functional type traits.

Twin Star Dairy is owned by Mike and his wife, Larine, and their children, Tyler and Brook. The dairy is managed by Joe Silveira.

The herd is enrolled on REAP and has a 2020 lactation average of 20,850 lbs. milk, 1,049 lbs. fat and 773 lbs. protein on 360 cows, marks that rank seventh for milk and fat and eighth for protein nationally in the division for herds with 300-749 records. The milking herd averages +166 for CM$ and +155 for NM$ and ranks #30 in the nation for herd average JPI at +38. The herd includes 22 Excellents and 591 Very Goods.