
In 1972, the AJCA Board of Directors established policy regarding undesirable genetic factors in the Jersey breed. It created reporting procedures and standards for scientific investigation. If a condition was determined to be genetically transmitted, the scientific facts were shared with all breeders of Jersey cattle.

This policy guided a 15-year effort to manage two costly abnormalities, Limber Legs and Rectovaginal Constriction, and was successful because it took “the more difficult, positive, open approach to this fundamental concept of ethics in the improved breeding of dairy cattle.”

Those principles are still in place 40 years later, and are likely more important than ever since genomics entered Jersey cattle breeding in January of 2009. Geneticists are making powerful discoveries about specific genes, markers and chromosomal segments that affect production, type and fitness traits of Jersey cattle. At the same time, says Kent Weigel of the University of Wisconsin–Madison, conditions thought to be inherited abnormalities “are not rare anomalies that occur once in a decade in a handful of genetically unfit animals. Scientists now believe that it is likely that every individual carries several genes that, if expressed in homozygous form, would lead to a severely impaired or lethal phenotype.”

After the April evaluations, geneticists detected a unique haplotype related to conception failure in approximately 25% of the thousands of Jersey genotypes being studied at the Animal Improvement Programs Laboratory. Jersey Haplotype 1 was associated with a conception rate of –3.7%. When an egg with the JH1 haplotype in its DNA is fertilized by a sperm that also has the JH1 haplotype, no live calf results.

Upon receiving this information, the AJCA Board of Directors acted at its regular meeting on June 21 to recognize undesirable genetic factors based on genomic detection and to designate Jersey Haplotype 1 (JH1) as an undesirable genetic factor. Requirements were established for the designation of Jersey animals as carriers or tested free based on a 50K or higher density genotype. Test status, labeled as JH1C for carrier or JH1F for tested free, now appears on AJCA performance documents and genetic evaluation reports.

JH1 is fairly common in the Jersey breed and has been present—though not identified—for at least five decades. According to AIPL, its frequency over the past 40 years has been between 20% and 25%. The current frequency is 23.4%. Eliminating JH1 is not really practical, nor is it desirable. “Imagine the genetic progress in milk yield, milk composition, conformation, health, and even fertility that would be lost by discarding thousands of haplotypes that are favorable for these traits while trying to eliminate the haplotype affecting fertility,” Dr. Weigel says. Instead he suggests that managing JH1 will be more productive for your herd and the Jersey breed.

“Managing” means evaluating bulls that have the JH1 haplotype for what they can bring to your bottom line. Some of the economic impact of Jersey Haplotype 1 is already accounted for in Jersey Performance Index™ and USDA Net Merit indexes because daughter pregnancy rate (DPR) is incorporated in these selection tools. What is recommended is to continue multi-trait selection based on JPI and/or NMS\$ with added attention to sire conception rate (SCR).

“Managing” also means avoiding matings with greater probability of embryo loss. “This is where we can use our new information powerfully,” Weigel says. “Nearly every Jersey sire whose semen is marketed for artificial insemination (A.I.) has been genotyped, so the genotypes of the service sire and the sire of the cow are usually known. In herds that rely heavily on A.I., it is possible to foresee almost every potential mating of a daughter of a bull with the JH1 haplotype to a service sire with the JH1 haplotype.

“Computerized mating programs offer a simple, inexpensive solution for avoiding affected matings,” advises Weigel, whose work funded by the AJCC Research Foundation resulted in the AJCA’s JerseyMate™ program and who is working on a genome-enhanced version of the program. “Producers should use these programs and follow through on the mating recommendations.”

JerseyMate™ now automatically eliminates matings of designated JH1 carrier bulls to designated JH1 carrier females. For other matings, JerseyMate™ discounts potential matings to JH1 carriers for the potential cost of days open based on the probability of inheriting the JH1 haplotype. The economic impact of a lost embryo due to JH1 is estimated at \$84 (42 days open x \$2.00/day). JerseyMate™ may recommend carrier to daughter-of-carrier matings. When this happens, it is because the potential economic gain is more than dollars lost from the impact on fertility due to JH1.

Reproductive efficiency is an important Jersey breed characteristic, and a key to the profitability of your Jersey business. The AJCA Board of Directors action to designate Jersey Haplotype 1 as an undesirable genetic factor means that information is now available to all Jersey owners so that you can limit carrier-to-carrier matings and manage the impact of JH1 on embryo loss.
