

# Genomic Data Adds Value in Marketing Holstein Sires Globally

Jetstream Genetics uses Infinium® BovineSNP50 BeadChip-based data to assess the genetic merit of young elite sires, optimize sire selection, and advance genetics for improved herd production.

## Introduction

With their classic black and white coloring, Holstein cattle are the highest milk producers of the dairy industry. Jeff Butler and Roger Turner of Jetstream Genetics have spent their lives driving genetic improvement of the breed. Growing up on Holstein dairy farms 700 miles apart, they first met as competitors in dairy cattle judging shows. The award-winning calves and cattle they showed became valued parents of future offspring. Later, they bought and sold the progeny of those animals as they made their way into the dairy industry, Jeff as co-owner of Butlerview Farms and Roger as Sire Analyst and International Sales Manager at Alta Genetics (1994–2012).

Through the years, they've seen a shift from using just phenotypic/pedigree driven selection towards the addition of genomic information to improve the accuracy of selection. When coupled with reproductive technologies such as *in vitro* fertilization and embryo transfer, this combination reduces genetic interval and more rapidly advances the Holstein breed genetically. The transition has taken several decades. At the competitions that they attended in the 1980s, their cows were judged solely on conformation traits such as udder shape and dimensions, structure of the skeletal frame, and overall dairy strength or appearance<sup>1</sup>. As artificial insemination (AI) and embryo transfer (ET) technologies were integrated into the breeding programs of breeders to shorten generation intervals, Holstein cattle breeders found they were breeding unproven dams and sires\*, with no guarantee that the results would be positive. Genomic tools, such as the Illumina Bovine SNP50K BeadChip, now enable Holstein farmers to assess cattle through a combined statistical genetic analysis of phenotypic and genotypic data to make more informed breeding decisions.

In 2012, Jeff launched Jetstream Genetics, an AI marketing organization, and hired Roger as Global Sales and Genetic Manager. The company is focused on offering the best sire genetics to the global marketplace. iCommunity spoke with Roger to learn how genetic data from the Illumina Bovine SNP50K BeadChip adds value to their Holstein sire selection and mating programs.

**Q: Why did you choose Holstein sire genetics as the product focus of your company?**

**Roger Turner (RT):** Jeff and I grew up on dairy farms and have a combined 60 years of experience raising, breeding, and managing Holstein herds. We know a lot about the breed. We also recognize that as members of the food production service industry, dairy farmers need an efficient product to be successful. The Holstein breed delivers the highest level of milk production of any dairy breed. For that reason, it's popular in North America and worldwide.

**Q: When did genetic selection join phenotype-based decisions in Holstein breeding?**

**RT:** In the 1950s and earlier, breeding decisions were based on estimated breeding values (EBV)<sup>†</sup> of cattle within the same herd. Progeny testing of bulls began in the 1960s, where data was collected on young sires and their offspring within a herd. In the early 1980s, a complete genetics-based model came into use. It captured ancestor and progeny information across herds, reducing herd-to-herd bias and providing a better view of the presence of detrimental and valuable traits.



Roger Turner is Global Sales and Genetic Manager at Jetstream Genetics.



View-Home Powerball P epitomizes Jetstream's focus on delivering the best sire genetics to Holstein farmers worldwide. He is the #1 naturally polled (hornless) sire in the world, scoring 80–90 genomic total performance index (GTPi) points higher than the next polled bull. Photo courtesy of Beth Herges

\*Dams and sires with no milking daughters.

<sup>†</sup>Estimated breeding value is calculated for certain traits based on pedigree information.

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**Q:** Did the use of *in vitro* fertilization (IVF) contribute to the shift from phenotype- to genotype-based breeding decisions?

**RT:** It's been a combination of IVF and genetics that's empowered the shift to more genotype-based breeding decisions. Together, they enable today's dairy farmers to obtain hundreds to thousands of calves from an award-winning sire.

The two technologies developed along parallel tracks. About the time that progeny testing began to be used, cryogenics and the use of liquid nitrogen to freeze sperm enabled IVF to shift from a local to a more regional distribution model. Although embryo transfer in cattle was demonstrated successfully in the 1950s, it wasn't until the early 1970s that it became widely used. That was just before genetics-based progeny models began to really take off.

Leveraging the latest advancements in IVF and genetic testing, breeders can now capture more pregnancies by more sires from younger females. Unfertilized ovum can be collected from two-month old heifers or younger, fertilized with young sire semen, and the embryo transferred into a young female for gestation. This shrinks the generation interval from 4.3 years to 2.2 years. Achieving a complete genetic turnover in half the time enables dairy farmers to make huge strides in advancing genetic progress in their herds.

“We use the BovineSNP50 BeadChip-based Zoetis HD50K tool to identify known traits, many of which are responsible for the success of certain cow families.”

**Q:** How is Jetstream Genetics enabling Holstein dairy farmers to take full advantage of what IVF offers?

**RT:** Jetstream Genetics was created with the goal of increasing the use of breed-defining young Holstein sires to improve herds worldwide. The genes for high milk production come through a sire's paternal and maternal lines. While many market the ovum and embryos of their females, not all dairy farmers are tapping into the earning potential of their sires. Through Jetstream Genetics leased royalty contracts, dairy farmers receive the full value of the high-quality dams they have in their herds. The higher the genetic value and maternal pedigree of the sire, the higher royalty they'll receive for its semen. They can then reinvest that royalty income into the female nucleus of their herd.

Butlerview Farms already has extensive experience in marketing embryos, females, and bulls from the latest generation of Holstein cows. Providing sire genetics enables us to expand our offering to the other half of the IVF equation. We're not a “brick and mortar” business.

Instead of owning bull housing, we're partnering with Alta Genetics to leverage their high fertility expertise and logistics experience. With low operating overhead and high-quality sire genetics, we're able to return high royalty payments to bull owners.

**Q:** How important are cow family pedigrees to your customers?

**RT:** Breeders and their clients are really looking for the depth of maternal pedigree. We look at sire stacks—the sire, the maternal grandsire, the maternal great-grandsire—that have had a lot of success within the industry. The pedigree provides reliability and credibility that a high genomically ranked bull will become a proven sire with daughters in milk production and classification.

**Q:** What are the important attributes you look for in selecting Holstein genetic sires?

**RT:** Conformation, production, health traits, and cow family certainly play a large factor in our selection. This lineage trait information is compiled by trained people using a scoring system that classifies the animals.

When you look at our current lineup, you'll see a number of sires that possess cow family names that are recognized globally. Families like Regancrest, Missy, and Sonnek. For example, Regancrest S Chassity has strong confirmation, was a 92 points Gold Medal, and was a Dam of Merit for a high-production cow. We have two or three of her sons and several other male descendants in our lineup. Chassity and her offspring package have sold for over \$1 million USD in 2009 and have proven to be a great financial investment.

Wesswood-HC Rudy Missy was a former #1 productive life cow. Cows with high production lactation months directly impact a dairy farmer's costs. A bull from the Missy cow family can sire several hundred daughters, increasing productive lactation by several months, and positively impacting a farm's bottom line. Missy now has great, great, great-grandsons that have successfully carried on that productive life trait.

Sonnek Damion Charlie is the Dam of one of our outstanding bulls called Golddust. He's the number 2 type bull in the breed today. He has been extremely popular since his release and basically sells out every month of production. What's unique about the family is that the Sonnek name (breeding prefix) has been carried under the same ownership for 40 years. Their philosophy of breeding good cows has withstood the test of time. We now have genomics data identifying several tremendous females within the Sonnek family.

**Q:** How many generations of cow family data do you assemble for each sire sample?

**RT:** We gather as much generational data from the Holstein Association as we can, often going back 10–15 generations. It's a comprehensive database that includes production classification and breed award information for all males and females within a cow family. Generation data validates cow family strength, enhancing the reputation of our product.

We're proud of the fact that all of our sires expect one have dams that carry VG (Very Good) or EX (Excellent) classification scores. We know of no other sire genetics organization that offers that level of quality.



