

How genomic technology is improving the sustainability of dairy production

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Genomic testing has dramatically improved the quality and sustainability of dairy cattle since its commercialization in 2010. Genomic testing enables better decisions at an earlier stage in the animal's life than traditional approaches and this affords dairy producers the opportunity to focus their limited resources on developing the replacement heifers more likely to generate better profitability. These better decisions are possible due to the greater reliability that genomic testing provides and that results in a more accurate ranking of animal genetic potential, even when those animals are full siblings.

Differences in genetic potential is nothing new to dairy producers. Genetic improvement of dairy cattle has been a cornerstone of the industry for the better part of 100 years and is in part, the reason that cows today are more productive than they were ten, twenty, and thirty years ago. We also know that single trait selection (e.g. milk potential) has unintended consequences when it comes to the health and fitness of the cattle. From a profitability perspective, we know that farm profitability is driven by cows who are productive, healthy, fertile, and long lasting. We also know that all heifers do not represent an upgrade to the cows that are in lactation and that genetic improvement through the use of selection indexes like Dairy Wellness Profit \$ (DWPS) is the best way to improve the productivity, health, fertility, longevity, and feed efficiency of cattle.

Genomic testing has grown substantially since 2010 and today millions of animals have been tested globally. Adoption of genomic testing as part of a farm's genetic improvement program has afforded producers the opportunity to create herds of easier to manage cows that produce as much, if not more milk, with fewer head. Long term users of genomic testing have been able to create herds that experience fewer health events, greater longevity, and greater lifetime milk compared to approaches that don't utilize genomic testing. In terms of tangible outcomes, when comparing the top 25% of cows to the bottom 25% of cows, the genetically superior cows lasted 28% longer, produced 38% more milk, and realized almost 40% greater profitability compared to genetically inferior cows. These associations demonstrate that genomic testing is a profitable choice when incorporated into a farm's genetic program.

