

High-Density Genotyping in Agrigenomics Interview: Zoetis

and allocate reproductive technologies, like sex-sorted semen and embryo transfer.

DR: We emphasize well-managed operations because the technology is particularly compatible when good practices and capabilities for data recording are in place. We see genomics as part of a comprehensive strategy rather than something individually inserted into a management system. We work with producers and their veterinarians to make sure performance metrics such as pregnancy and conception rates, and health factors such as calf mortality/morbidity are satisfactory before implementing a genomic testing program.

Q: *How did Zoetis go about choosing its genotyping platform?*

Sue DeNise (SD): Illumina provides the industry standard for high-density genotyping. Their platform reduces the complexities of multiplexing tens of thousands of markers, while offering the quality and coverage we need for highly accurate predictions. The streamlined and well-defined process allows us to deliver in a time frame acceptable to our clients. It's a very solid platform.

JO: Illumina platforms have established themselves as the gold standard for cattle genomics globally. This helps to ensure that resources can be assembled from a variety of collaborators throughout the world to help develop and implement technologies that can provide value to livestock producers.

“Illumina BeadChips are the industry standard for high-density genotyping.”

Q: *How does Zoetis add value to its customers by using Illumina technology?*

Jon Glynn (JG): Our products are typically used to aid selection. That is, a customer genotypes an animal, the molecular genetic value is predicted from the SNP marker genotypes, and that prediction may be blended with classical genetic evaluation to create a more accurate prediction of the animal's genetic worth. In order to maximize accuracy, tens of thousands of markers are required to appropriately describe the genetic variation present. Illumina provides a cutting-edge product for adding value to classical predictions and allows us to reliably serve our customers.

SD: Illumina has a product that's really dependable and very robust. It is a great platform for interrogating tens of thousands of SNPs in a high-throughput laboratory.

Q: *How do you help customers use genome data to make decisions?*

JO: When we're speaking with beef, dairy, or sheep producers, the technology can be a bit overwhelming for them at times. We recognize that genomic data is only valuable if its meaning and application are understood. We try to help translate and illustrate to them in real-world conditions what the data means in terms of their ability to make better decisions. We offer a variety of planning and decision support tools to ensure that our customers get the most from their investment in genetic testing.

DR: Using CLARIFIDE in dairy cattle as an example, the producer receives more than 60 data points on the individual animal tested. However, most of our customers make binomial decisions about whether to invest in or give that animal an alternate career path based on the DNA outcome. We translate the complexity of the technology, and help them apply the information to advance their operation's objectives.

JO: For those 60 data points, we'll distill the data down into a handful of key data points, ultimately rank those animals, and assemble the information so it's ready-made for a decision. We'll apply the technology in a field setting, do the trials, and demonstrate it works. We spend a lot of time trying to educate. We don't want to make molecular geneticists out of every producer, but at the same time we don't want it to be an entirely “black box” exercise.

Q: *What advancements are your customers making because of the Zoetis and Illumina partnership?*

JO: We are seeing a variety of producers that have been able to use our Illumina platform products—like our CLARIFIDE and HD 50K assays—to great effect in managing their farms and livestock more effectively. Dairy producers who have more heifers than they need to meet replacement demands are able to identify and market heifers with low genetic potential that don't fit their herd's objectives. We see beef producers that are able to make better bull purchase decisions by leveraging genomically enhanced expected progeny differences identified with our HD 50K assay.

Commercial beef producers purchase bulls as herd sires to breed their cows. This is an important decision because many calves will be born out of that sire. If the producer makes a mistake in choosing that sire based on the genetic potential of that bull, it could be very costly financially. The purebred producers will have us genotype all of the bulls using Illumina BeadChip technologies offering a higher degree of confidence for their bull buying customers.

“We see beef producers that are able to make better bull purchase decisions by leveraging genomically enhanced expected progeny differences identified with our HD 50K assay”

Q: *What are recent trends in the use of genetic testing?*

DR: The number of genotyped animals in the USDA-CDCB dairy genetic evaluation and in the beef sector has begun to accelerate. In the beef sector, we have surpassed 50,000 animals tested with regard to the Zoetis HD 50K for Angus offering in collaboration with our US partner, Angus Genetics. While we're encouraged with that level of adoption, there's about 300,000 animals registered annually by that breed in the US. We still have tremendous upside potential regarding adoption within Angus seedstock operations and the commercial buyers of Angus genetics domestically and globally.

Illumina • 1.800.809.4566 toll-free (U.S.) • +1.858.202.4566 tel • techsupport@illumina.com • www.illumina.com

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