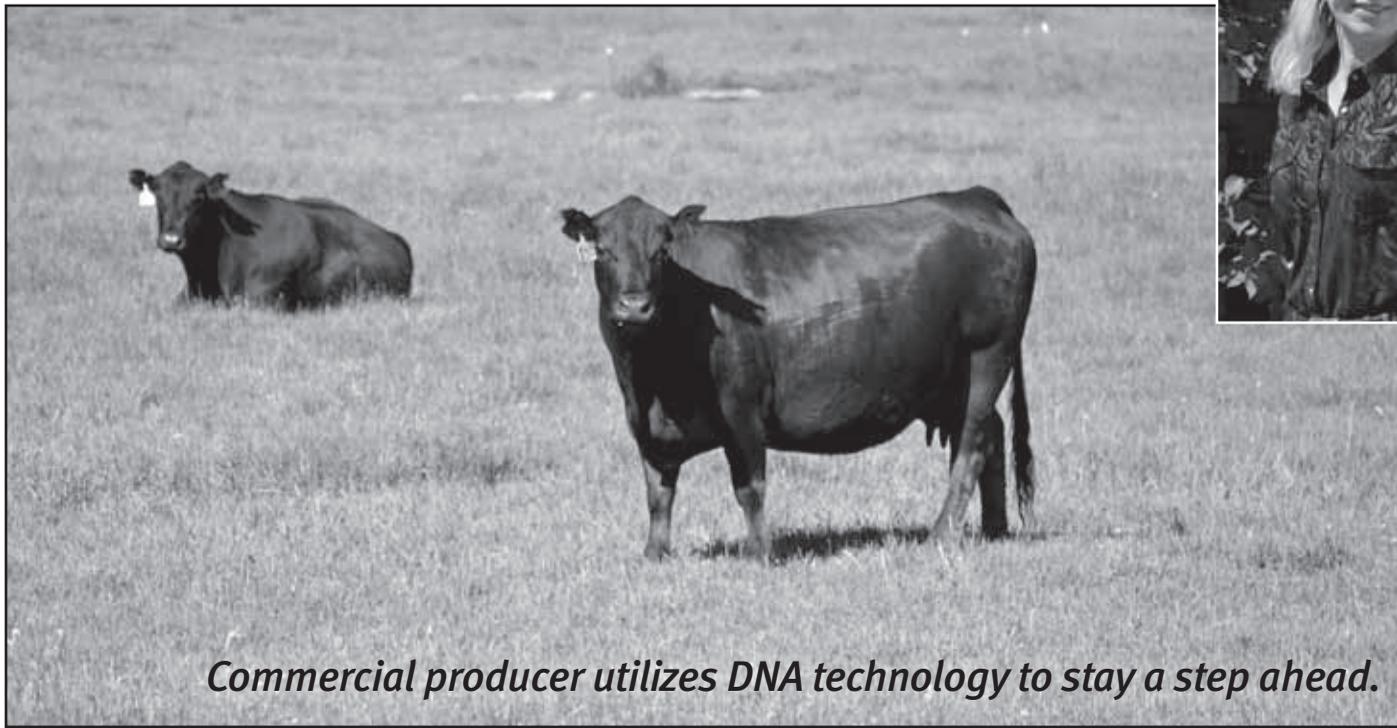


Take Advantage of All Opportunities



Commercial producer utilizes DNA technology to stay a step ahead.



Above: Richard and Vicki Nelson have added DNA technology to their selection and management tool box.

Richard and Vicki Nelson purchased the historic Izee Ranch, Izee, Ore., in 1993 with one goal — produce beef that will satisfy consumer demands and help support future generations. Now, after 18 years of utilizing every available opportunity to add marketability and quality to their commercial cow herd, the Nelsons have added DNA technology to their selection and management tool box.

“Since purchasing the ranch, we’ve been in the process of building a cow herd that represents

the attributes that will produce calves with a high-quality carcass, fit consumer demand and sell at a price that will keep our family in this business,” Richard Nelson says. “We source- and age-verify all of our calves and sell them into natural programs, setting them up to capture premiums. Now, genomic technology enhances our vision, and the herd’s potential to succeed.”

Low-hanging fruit

Although DNA technology is relatively new to the beef industry,

Nelson has been utilizing it for years in his plant breeding business.

“In our day job, which is a plant breeding company in the Monterey Bay, Calif., area, we develop new varieties of strawberries, raspberries, blackberries and artichokes, and we use molecular enhancements in our breeding programs there, as well,” he says.

In his cattle operation, the bull battery was the first genetic target for Nelson. Last year, they tested their Angus bulls with the High-Density 50K (HD 50K) panel from Pfizer Animal Genetics. Richard says they were pleased with what they learned, and they even uncovered a few gems.

“Typical utilization of EPDs (expected progeny differences) is extremely important, but until now, there were some breakthroughs and unique individual animals that we might not find otherwise,” Nelson says. “In fact, we found a bull last year that was extremely favorable for carcass traits and feed efficiency. We are switching to an AI program for our replacement heifers, and would like to use genomic information to find more uniquely superior sires to use in this endeavor.”

While the DNA information has proven valuable on the Izee Ranch bull battery, Nelson expects the true value will be found with replacement heifers, helping reduce the risk of introducing anything less than the best females back into his herd.

“We also are going to use the genomic data to identify parentage with our potential replacement heifers so we only keep females from top bulls that we now know are passing along the performance we are looking for,” he says. “That’s going to be a big benefit to help advance our cow herd dramatically. Even though our bull battery is top-notch all the way through, there’s always going to be a bottom percentage of the heifers that we want to eliminate.”

And while Nelson’s calves have regularly topped 93%-96% USDA Choice and Prime, he says he knows there is always room for improvement.

“We know feed efficiency is an important factor to feedyards,” he says. “So we’re concentrating heavily on maintaining genetics that are important to us as a cow-calf operation, while also incorporating feed efficiency traits that will benefit the feedyard.”

He adds that tenderness and other palatability factors are extremely important given the natural and branded beef programs his calves are feeding into. However, he has to keep all of these factors in mind while selecting moderate-sized cows that will thrive in the steep terrain of eastern Oregon.

Back to the source

After mapping out a plan for incorporating DNA technology into his operation, Nelson went straight to his seedstock supplier and requested additional information on herd sire prospects. After years of working closely with Byrd Cattle Co., Red Bluff, Calif., Nelson requested that they DNA-test several sire prospects with HD 50K.

“Richard came to us and said he would like us to test several bulls he was interested in based on their EPDs and ultrasound scan data,” says

Table 1: GE-EPDs and approximate progeny equivalents

	AGI heritability	AGI HD 50K correlation	Avg. change in EPD from HD 50K¹	Avg. 50K change in ACC from 0.052	Approximate progeny equivalents
Birth wt.	0.42	0.51	±0.45 lb.	0.25	8
Weaning wt.	0.20	0.52	±2.2 lb.	0.23	16
Residual ADG ³	0.31	0.65	±0.03 lb./day	0.27	13
Yearling wt. ⁴	0.20	0.64	±3.1 lb.	0.27	20
Milking ability	0.14	0.32	±1.2 lb.	0.15	12
Carcass wt.	0.31	0.48	±4.1 lb.	0.17	7
Fat thickness ⁵	0.26	0.56	±0.01 in.	0.23	11
Ribeye area ⁵	0.32	0.60	±0.10 in. ²	0.23	9
Marbling score ⁵	0.26	0.57	±0.08 units	0.24	12

¹Derived from Angus animals with ≤ 0.30 accuracy.

²Represents accuracy from only pedigree information.

³Dry-matter intake.

⁴Postweaning ADG.

⁵Carcass progeny records — equivalent to more than 30 scanned progeny records.

Ty Byrd. “He is a very good customer who pulls out all the stops when it comes to doing things right in his operation, so we were happy to provide this information on our sale bulls.”

Byrd believes all segments of the beef industry can learn from what the Nelsons have built with their cow herd.

“Richard is an out-of-the-box thinker who has been very successful in his core plant breeding business,” Byrd says.

“Bringing his mind-set and unique spin on things to the cattle business has helped him make his particular situation more profitable. Not only is he making his cow herd work for his environment, but he has proven they can be successful all the way through the production chain, as well.”

Although not all of his customers are as hands-on as Nelson, Byrd believes DNA information can help them, too.

“When we tell people what our bulls will do for them, the bulls have to go out and do it,” he says. “Whether they are supposed to be low-birth-weight or high-marbling bulls, we have to be correct in our projection, or we are going to be out of business in a hurry. HD 50K enhances our ability to be right.”

One number, more predictability

Kent Andersen, associate director of technical services for Pfizer Animal Genetics, says both Nelson and Byrd have the right idea for utilizing the information.

“The applications for DNA technology are as unique as each individual operation,” Andersen says. “However, the common thread is always that producers can use this information to make better decisions.”

Since the American Angus Association has incorporated genomic information into their national cattle evaluation (NCE), Angus breeders and their customers now have access to genomic-enhanced EPDs. Andersen says this gives them the best of both worlds — the EPDs they know and trust and the power of DNA, in one single value.

“GE-EPDs powered by HD 50K provide a dependable option in genetic evaluation for multiple traits of economic importance, before the availability of progeny information and for several traits that are difficult or costly to measure,” Andersen says.

Byrd says it’s this combination, and the opportunity to use it to make better decisions about young animals, that’s exciting.

“EPDs are the gold standard for evaluation, so the more tools and information we can add to the EPD tool box, the better off we will be, and the more correct decisions we can make,” he says. “One of the great things about adding HD 50K information to our EPDs is that it helps speed up the progeny-testing process. Progeny information is a wonderful thing, but with the addition of the genomic information, we can essentially take two years out of our testing window. If a bull



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isn't going to end up being a calving-ease bull, we don't have to take two years to learn that anymore; we can know today."

Value by progeny equivalents

To better understand the value of the addition of DNA information to EPDs, Andersen says it helps to express the

change in EPDs and their accuracies in terms of the equivalent number of progeny with performance records that would need to be included in the genetic evaluation. To do this, EPDs were reviewed for almost 500 head, both before and after the addition of HD 50K information. Then, taking into account the heritability of

each trait and the correlations computed by Angus Genetics Inc.® (AGI) to enable GE-EPDs, the respective improvements in accuracy values were calculated and expressed in approximate progeny equivalents.

The results, available in Table 1 (see page 46), show that depending on the trait, the average increase in accuracy for animals with initial EPDs based only on

pedigree information, accuracy of 0.05, was equal to the addition of seven to 20 progeny performance records. For example, with HD 50K the GE-EPDs and accuracy values for weaning weight are equal to the addition of weaning weights in contemporary groups from approximately 16 progeny included in the genetic evaluation.

"For females, these improvements in the dependability of EPDs equal more than a lifetime of progeny performance records, which enables years of more profitable mating decisions," Andersen says. "And for bulls, this increase in accuracy can equal a significant portion of a first calf crop — leading to less risky and more dependable selection decisions."

Time to get started

It's this value that Nelson encourages other producers to take advantage of when making decisions about young animals and difficult-to-measure traits.

"Anything we can do to help enhance the probability and reliabilities of EPDs for young animals, the better off we will be," Nelson says. "For a yearling bull, the reliability of his EPDs is basically a function of his sire and dam. With genomic-enhanced EPDs, we can begin to have greater confidence in his numbers, which is very important."

Although Nelson has an extensive science background, he thinks DNA technology can help all types of producers, and he encourages them to get started.

"It's absolutely the future for enhancing beef operations from the cow-calf producer all the way through to the consumer as time goes on," he says. "There is so much information now to digest when it comes to seedstock purchases, this just adds another layer — a pretty significant layer at that. Once people begin to understand the value of this information, it will be a great benefit to our industry."



Editor's Note: *This article was provided by Pfizer Animal Genetics. Publication of this article does not represent a preference by the American Angus Association or Angus Productions Inc. as to which DNA test — Pfizer's HD 50K for Angus or Merial's Igenity Profile for Angus — cattlemen should use to gain genomic information on their cattle.*



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