

The Rancher's Guide to 50K



Bull selection is one of the most significant decisions ranchers make in terms of influencing the overall profitability of their operations; therefore, Red Angus strives to deliver reliable genetic predictions to stakeholders to ensure producers are making the most informed decisions possible in pursuit of production goals.

For years, ranchers utilizing Red Angus EPDs (Expected Progeny Differences) in their selection decisions have enjoyed the built-in reliability and risk reduction provided through the breed's early adoption of Total Herd Reporting (THR) data. To further advance EPD accuracy and reliability, Red Angus can now incorporate 50K genomic data.

For generations, animal breeders have relied on phenotypic measurements to determine what the animal possesses at the gene level. Now, with the inclusion of 50K genomic data, we can actually measure the impact of identified gene effects before the weight or measurement is ever recorded.

Red Angus' new 50K test proves to be a game changer.

- **Ensure your yearling heifer bulls are “calving-ease specialists.”**
- **Confirm your cowherd-building bulls have optimal genes for maternal traits.**
- **Make certain your carcass bulls are superior grid producers.**

Information gained from 50K genomic data and Total Herd Reporting data provides Red Angus stakeholders' EPDs with unsurpassed reliability.



The Power of 50K

Performance observations collected at the ranch are impacted by the animal's genetics, which can include hundreds or thousands of genes. Recent advancements in DNA technology have now allowed for the identification of a portion of genes that have a significant favorable or unfavorable impact on a particular trait.

50K is the tool that observes 50,000 locations on the animal's genome and identifies which genes that animal possesses and their impact on various traits. The result: additional informative data available for EPD calculations.

Genetic predictions will always be based on data; however, the means in which we collect data has – and will likely continue to – evolve. Previously, the Red Angus Association of America relied solely on phenotypic observations such as weaning weights and ultrasound data to calculate EPDs. The delivery of 50K technology provides additional data points that can be applied to an animal's EPD calculations. Data obtained from a 50K test can be as informative as a bull's first calf crop or a cow's lifetime production record, thus, providing stakeholders with a tool to vastly increase accuracy of an animal's EPDs.

Accuracy

EPDs predict an animal's true genetic merit, which can be passed on to offspring. As the amount of data included in an animal's EPD calculation increases, ranchers can have more confidence that the EPD correctly identifies the animal's true genetic merit. This is communicated to stakeholders in the form of "Accuracy," which is printed in conjunction with each EPD and ranges from 0 to 99.

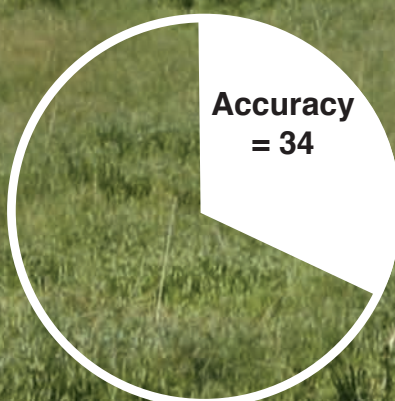
Increased Data = Increased Accuracy = Increased Reliability

The power of 50K is the ability to collect additional genetic prediction data before an animal is selected to enter or exit the herd. Thus, allowing producers to achieve their genetic goals at a faster rate, as the genetic predictions used in selection decisions are of higher accuracy.

Pedigree + Performance Record



**Pedigree + Performance Record
+ 50K Genomic Data**



**Pedigree + Performance Record
+ 10 Progeny**



Introducing the RA50K

Red Angus' ability to deliver a superior 50K test is largely due to Red Angus stakeholders' submission of samples on animals strategically identified to be more informative in the development of a Red Angus-specific 50K test.

RAAA's 50K Project effort resulted in 1,740 Red Angus animals with 50K data. Through collaboration with National Beef Cattle Evaluation Consortium, this population of animals were used to develop the Red Angus 50K (RA50K).

Are All 50K Tests Equal?

Following development of the RA50K, animal breeders at the University of Nebraska-Lincoln (UNL) performed a third-party evaluation of the RA50K to determine its effectiveness in predicting genetic merit of Red Angus animals.

Foreseeing the need to provide Red Angus stakeholders with an unbiased comparison of all 50K tests developed for Red Angus cattle, UNL expanded their research to include approximately 250 animals that had test results for both the RA50K and PF50K (developed by Zoetis) products. These animals were not included in the development of either test, so Red Angus stakeholders can feel confident in the genetic correlations achieved through UNL's research.

Two Major Factors to Consider When Determining Which 50K Test to Invest In:

1. The genetic correlation between the genomic data and the predicted trait, e.g. genomic data for marbling and phenotypic data for marbling. A larger correlation would indicate that the 50K test is more informative, therefore, resulting in a larger increase in EPD Accuracy.

2. Not all 50K tests impact the same traits. In addition to the information RA50K provides to increase accuracy for growth and carcass traits, it is anticipated that important cowherd-building traits such as Stayability, Heifer Pregnancy, Maintenance Energy as well as Calving Ease (Direct and Maternal) will be added to RA50K by the late summer of 2013. Stakeholders who invest in RA50K testing now will automatically have their animals' EPDs updated as soon as validation is completed for those cowherd traits.

Genetic Correlations*

	RA50K	PF50K
CED	n/a	.59
CEM	n/a	.60
BW	.64	.59
WW	.55	.49
YW	.58	.44
MILK	.40	.32
MARB	.61	.50
REA	.50	.48
FAT	.49	.43

*Genetic Correlations are recalculated as significant data is collected. To access the most up-to-date genetic correlation comparison visit RedAngus.org.



Which Animals Should I Test?

Recognizing that the incorporation of 50K data will increase the predictive ability of EPDs, producers must determine which animals will benefit the most from an investment in 50K. Ranchers can plan for the greatest return on their investment in 50K testing by remembering:

- The impact of genomic information will ultimately be overwhelmed by large numbers of progeny data, so the benefit of testing high Accuracy animals is negligible.
- Conversely, lower Accuracy animals have the most significant gains in Accuracy through 50K testing. Thus, testing yearling bulls prior to their sale will offer ranchers the piece of mind that their customers are making selection decisions based on more accurate information.
- Because bulls can have hundreds of progeny, testing replacement heifers can provide information equivalent to a female's lifetime progeny data.



Accessing the RA50K

Red Angus stakeholders who choose to utilize the RA50K must submit an animal's DNA sample to the RAAA National Office. Accepted DNA samples include: hair, blood, semen or tissue. Red Angus' relationship with GeneSeek, who is considered the leading commercial agricultural genetics service laboratory in the United States, provides stakeholders with expedited, economical genotyping. Once the genomic data is provided back to RAAA and incorporated into the tested animal's EPDs, stakeholders are provided EPD reports detailing the impact of the genomic data.

Full-Service Genetic-Testing Provider:

Red Angus stakeholders who order RA50K, will further enhance selection accuracy and reduce risk through GeneSeek's newly released "GeneSeek Genomic Profiler." This includes 80K genomic data (all informative SNPs from the standard 50K).

PLUS...

- Parent Verification
- Osteopetrosis (OS)
- Mannosidosis (MA)
- Neuropathic Hydrocephalus (NH)

...all for one low price: \$80.

Information is power...
Order your RA50K today!

Ranch Tested. Rancher Trusted.

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