RISK MITIGATION, INSURANCE OR A MEASURE OF EXACTNESS?

How accuracy values are all of the above for Angus breeders.

by Miranda Reiman, director of digital content and strategy

Some people jump out of airplanes for sport, and others prefer to go no higher off the ground than a stepladder. Some gamblers limit themselves to spending $20 at the slot machines, and others spend an entire evening at the Vegas blackjack tables. Some breeders use only proven sires; and others risk a young, untested bull for a chance to find a winner more quickly.

They're different scenarios, but illustrate the same point: everyone's appetite for risk is different.

"I think of EPD [expected progeny differences] accuracies in terms of risk tolerance," says Troy Rowan, a University of Tennessee geneticist. "How much risk are you willing to tolerate that the number you see here isn't that animal's actual genetics?"

In essence, that's what accuracy, reported in values from 0.00 to .99, signifies.

"We're predicting the genetic merit of individuals, using all the pedigrees, phenotypes, genotypes, that is all the data available on the individuals," says André Garcia, American Angus Association geneticist. "It's not a perfect prediction, and that is why we have a measure of accuracy coupled with it."

It's not just a guess, but a highly educated and data-informed assessment.

FEWER SURPRISES

"I think a lot of times when folks are confused about EPDs and why they can change over a lifetime, they forget that the EPD is a statistical estimate and our confidence increases as we have more data to back that estimate up," Rowan says.

More data is the single action a breeder can take to improve the accuracy on their own bulls (see sidebar on page 37) and acts as an insurance policy, he says. The more data, the less potential for surprises.

"If it's a proven bull, it has a high accuracy, and you know that even if you dump a lot of data into the evaluation, that EPD is not likely to change," Garcia explains. "If it's a young bull that has very small accuracy, when you add more data, then there's more possibility of a change on that EPD."

However, a high accuracy does not automatically mean a sire is the best one for the job, Garcia warns.

"If an animal has a very high accuracy and an unfavorable EPD, it just means that you are very sure that animal is not very good," he notes.

The best way to make rapid improvement in accuracy before actual performance data can be collected is genomic testing. Depending on the trait, it can account for up to 20 to 25 actual progeny records, a stat that is meant to incentivize testing not disincentivize data collection, Garcia says.

"In the age of genotyping, phenotype is king." Mike Coffey, Scotland's Rural Agriculture College, said that, but it's a quote Rowan points to often.

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“IN THE AGE OF GENOTYPING, PHENOTYPE IS KING.”

— MIKE COFFEY

"It's true because we can't stop making those ties between genotypes and phenotypes," he says. "The genomic piece would fall apart if we just stop collecting all of those actual measurements."

Rowan says there's still suspicion among some breeders when it comes to genomics. With his Extension appointment, he commonly fields calls when a producer submits genomic information, and that individual animal's EPDs trend down (the calls don't come when the numbers go up, he jokes).

"When you get a genomic test result back and it gets integrated into the genetic evaluation, it's always good, a hundred percent of the time," Rowan states. "It's not that the genomic test hurt the genetic merit of your animal. It just brought that prediction to a point that's closer to the actual real inherent value, and that's valuable because it allows you to make greater genetic progress because you have a better idea of that animal's true potential."

Knowing more guards against selling potential problems or genetics that aren't what you thought they were, Rowan says.

QUICK CHANGE VS. FEWER WRECKS

That's hard to hear, especially when invested in a sire line whose EPDs change. That's why Alan Miller, Prairie View Farms and immediate past Angus Genetics Inc. (AGI) Board chair, suggests a need for a renewed awareness around accuracy.

"We could have whole discussions on whether we're using EPDs as breeding tools or marketing tools, and if you're actually using them as breeding tools, you have to use accuracies in tandem with them," Miller says.

If you're headed in the right direction, speed is a good thing. If you're headed the wrong way, the opposite is true, he notes.

"When we were in driver's ed, we were taught the speed limit and how you want to go fast enough to get somewhere, yet the faster you go if you have an accident the more damage that's going to be done," Miller says, suggesting that analogy fits the discussion around using proven sires vs. the newest genetics. "You'll make rapid change, but if you have an accident, it's going to be a big ole wreck."

ACCURACY AND ASSOCIATED POSSIBLE CHANGES

Accuracy	CED	BW	WW	YW	RADG	DMI	YH	SC	Doc	Claw	Angle	PAP	HS	HP
.05	9.7	2.55	14.9	24.3	.065	.763	.47	.76	16.7	.14	.12	2.15	.26	7.7
.10	9.2	2.42	14.1	23.0	.061	.723	.44	.72	15.8	.13	.12	2.04	.25	7.3
.15	8.7	2.28	13.3	21.7	.058	.682	.42	.68	14.9	.12	.11	1.93	.23	6.9
.20	8.2	2.15	12.6	20.5	.054	.642	.39	.64	14.0	.11	.11	1.81	.22	6.5
.25	7.7	2.02	11.8	19.2	.051	.602	.37	.60	13.2	.11	.10	1.70	.21	6.1
.30	7.2	1.88	11.0	17.9	.048	.562	.34	.56	12.3	.10	.09	1.59	.19	5.7
.35	6.7	1.75	10.2	16.6	.044	.522	.32	.52	11.4	.09	.09	1.47	.18	5.3
.40	6.2	1.61	9.4	15.4	.041	.482	.29	.48	10.5	.09	.08	1.36	.16	4.9
.45	5.6	1.48	8.6	14.1	.037	.442	.27	.44	9.7	.08	.07	1.25	.15	4.5
.50	5.1	1.34	7.9	12.8	.034	.401	.25	.40	8.8	.07	.07	1.13	.14	4.1
.55	4.6	1.21	7.1	11.5	.031	.361	.22	.36	7.9	.06	.06	1.02	.12	3.7
.60	4.1	1.08	6.3	10.2	.027	.321	20	.32	7.0	.06	.05	0.91	.11	3.3
.65	3.6	.94	5.5	9.0	.024	.281	.17	.28	6.1	.05	.05	0.79	.10	2.9
.70	3.1	.81	4.7	7.7	.020	.241	.15	.24	5.3	.04	.04	0.68	.08	2.4
.75	2.6	.67	3.9	6.4	.017	.201	.12	.20	4.4	.04	.03	0.57	.07	2.0
.80	2.1	.54	3.1	5.1	.014	.161	.10	.16	3.5	. 03	.03	0.45	.05	1.6
.85	1.5	.40	2.4	3.8	.010	.120	.07	.12	2.6	.02	.02	0.34	.04	1.2
.90	1.0	.27	1.6	2.6	.007	.080	.05	.08	1.8	.01	.01	0.23	.03	.8
.95	.5	.13	.8	1.3	.003	.040	.02	.04	.9	.01	.01	0.11	.01	.4

Using proven sires "keeps us out of the ditches," he says.

"I don't know if in the era of single-step and genomically enhanced EPDs, if we don't think about having to use accuracy in tandem with that or if we're just trying to move at such a rapid pace that we're not allowing accuracies to bog us down and chasing the bigger EPDs to try to get them out there?"

Of course, using *only* proven sires and never testing young ones would slow down overall progress and ignore the most recent advancements in the breed.

"The selection tool is still the EPD, but it's important to pay attention to accuracy so that you know how to manage the risk," Garcia says.

The Accuracy and Associated Possible Changes table (see below) published by the Association provides context and is a helpful guide for gauging what could happen.

"As a seedstock industry especially, our goal is to drive genetic progress, not just within the Angus population, but amongst all of our commercial customers," Rowan says.

It's a big responsibility that comes with risk and a little insurance to make it more palatable. AJ

CEM	Milk	MW	MH	CW	Marb	RE	Fat
10.4	9.5	38	.52	20	.29	.30	.041
9.9	9.0	36	.49	19	.28	.28	.039
9.3	8.5	34	.46	18	.26	.27	.037
8.8	8.0	32	.43	17	.25	.25	.034
8.2	7.5	30	.41	16	.23	.23	.032
7.7	7.0	28	.38	15	.22	.22	.030
7.1	6.5	26	.35	14	.20	.20	.028
6.6	6.0	24	.33	13	.18	.18	.026
6.0	5.5	22	.30	12	.17	.17	.024
5.5	5.0	20	.27	11	.15	.16	.022
4.9	4.5	18	.24	10	.14	.14	.019
4.4	4.0	16	.22	9	.12	.12	.017
3.8	3.5	14	.19	7	.11	.11	.015
3.3	3.0	12	.16	6	.09	.09	.013
2.7	2.5	10	.14	5	.08	.08	.011
2.2	2.0	8	.11	4	.06	.06	.009
1.6	1.5	6	.08	3	.05	.05	.006
1.1	1.0	4	.05	2	.03	.03	.004
.5	.5	2	.03	1	.02	.02	.002

UPPING THE ACCURACY

A bull with a low accuracy is a just a high-accuracy bull waiting for the information to make it so.

"Every bit of data contributes to it," Miller says. "It's not just the animal's own information, but generations' worth of data that adds value."

Rowan says there are four main categories that contribute:

+ Contemporary groups.

"The more representative and complete the contemporary group is, the more accurate that EPD will be, because we're able to better account for the environmental variation that plays into recorded phenotypes," Rowan says.

+ Performance records.

"You'll see a jump in accuracy when you turn in a record on an individual animal," Rowan says, "In the context of a seedstock producer, the more different types of records that you're able to turn in, you'll see those increases in accuracy right away on those animals that you report data for."

+ Records on related animals.

"We're able to increase the accuracy of other animals based on the genetic ties that we see between them," Rowan says.

+ Genotypes.

"A genomic test across the board increases your accuracy, because you're able to better represent those relationships between the animals and the pedigree based on DNA sharing versus the pedigree estimates of relatedness," Rowan notes.

Breeders who have historically participated in MaternalPlus® or Angus Herd Improvement Records (AHIR®) generally have a large number of high-accuracy sires.

"We've seen our really dedicated 'performance breeders' that have submitted full sets of data for generations, and that's why their accuracies are so much higher than those who are maybe a little late to the game," Miller says. "Their years of work and effort to submit all that information makes their numbers more accurate; but then thanks to single-step, it's making everybody's numbers better, too, because it's tying that information to other people's pedigrees, too."