RAAA/ASA Multibreed Common Base

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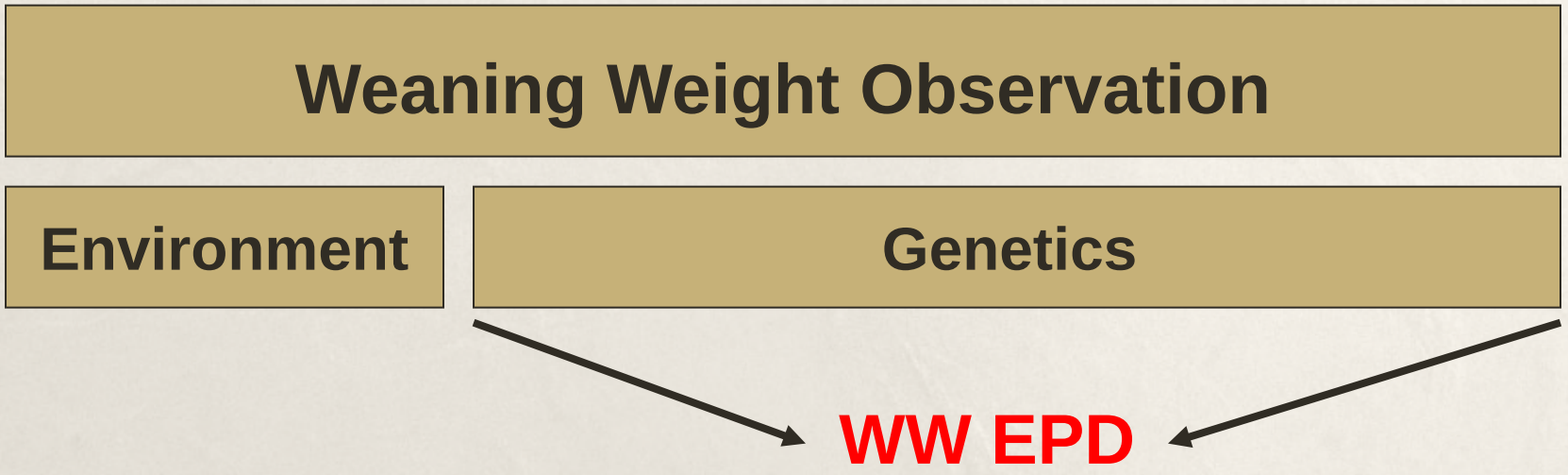
COLORADO BEEF Profit ALLIANCE

What are EPDs?

* Values that predict the genetic merit of an animal



How to Use EPDs

* Bull A's WW EPD is **+70** lb.
* Bull B's WW EPD is **0** lb.
* The expected difference between the average WW of Bull A's progeny and the average WW of Bull B's progeny is **70 lb**

How to Use EPDs

* Bull A's WW EPD is **+100** lb.
* Bull B's WW EPD is +**30** lb.
* The expected difference between the average WW of Bull A's progeny and the average WW of Bull B's progeny is **70 lb**
* **What Changed?**
  * **Base**

What is the Base?

* The base is the level of genetic merit associated with an EPD of zero.
* A birth year or subpopulation is usually chosen to represent the base.
  * Average SM, AN, HH and BR in 1991 calf crop
* The average EPD of all animals born in base year or in the base subpopulation is zero.

Base = Politics + Marketing

* Most breed associations set their EPD base according to how they want their breed to be perceived
* Commercial producers using crossbreeding cannot directly compare EPDs across breeds
  * Forces producers to learn numerous sets of EPDs
  * Even worse, must use less informative data to make selection decisions
    – Pedigree, actual and adjusted weights, ratios, etc.

The Foundation

- In 2010 ASA, RAAA, and CAA (Canadian Angus) merged databases for EPD calculations
  - >9 million total animals
    - >3,000 sires with progeny in both RAAA and ASA
  - Evaluated with a true multibreed model
    - Accounts for heterosis and breed differences
- Continued to publish the resulting EPDs on our own breed-specific bases
  - Simmental, Red Angus, and hybrids still weren't directly comparable

Truly Servicing the Commercial Producer

* Fall 2012 MB EPDs published on a **common base**
  * All animals in ASA and RAAA databases directly comparable!!!
    * BW, WW, YW, Milk, TM, Marb, YG, CW, REA, Fat
* Simplified selection for the end users of Red Angus and Simmental genetics
* Better arms RAAA and ASA to gain market share

MB Common Base

Current Average EPD of Purebred Non-Parents – MB Common Base

Breed	BW	WW	YW	Milk	Marb	YG	CW	REA	Fat
RAAA	-1.0	55	83	19	0.38	-0.01	18	0.15	0.00
ASA	2.6	64	91	22	0.07	-0.26	28	0.59	-0.06

Previous Average EPD of Purebred Non-Parents

Breed	BW	WW	YW	Milk	Marb	YG	CW	REA	Fat
RAAA	-0.1	32	60	17	0.08	-0.03	36	0.09	0.00
ASA	0.7	33	59	4	0.17	0.00	-2	0.12	0.01

Yes, the EPDs Changed… But Rank Within Breed DID NOT

* A SM bull that was in the top 10% for BW on the old base is still in the top 10% for BW on the MB base
* An AR bull that was in the top 25% for WW on the old base is still in the top 25% for WW on the MB base
* A SM bull that was average for Marb on the old base is still average for Marb on the MB base
* An AR bull that was average for REA on the old base is still average for REA on the MB base

Red Angus Example
Cherokee Canyon 4912

Trait	BW	WW	YW	Milk	Marb	YG	CW	REA	FAT
"Old" RAAA Base	-0.7	45	69	14	0.19	-0.20	40	0.67	0.01
"New" MB Base	-1.4	67	90	16	0.49	-0.18	21	0.73	0.01

Red Angus Example
Cherokee Canyon 4912

Trait	BW	WW	YW	Milk	Marb	YG	CW	REA	FAT
“Old” RAAA Base	-0.7	45	69	14	0.19	-0.20	40	0.67	0.01
% Rank (Old)	44%	18%	38%	65%	29%	6%	43%	2%	44%
“New” MB Base	-1.4	67	90	16	0.49	-0.18	21	0.73	0.01
% Rank (New)	44%	18%	38%	65%	29%	6%	43%	2%	44%

Progress Means Change

* All users of Red Angus and Simmental genetics will have to adjust to the MB common base.
* May be a struggle at first but be patient…you will soon get accustomed to it.
* Best way to become familiar with it is to learn the breed averages and study the percentile tables.

Assisting Your Customers in the Transition

* Perfect opportunity to reach out to your customers
* Provide RAAA and ASA educational material
* Print RAAA/ASA developed insert discussing the base change in your catalog
* Print percentile rankings in your bull sale catalog

RAAA and ASA's Strategic DNA Plan: Our Shared Vision of How DNA Will Advance Genetic Evaluation

TAC Vision

- The ASA-RAAA multibreed genetic evaluation delivers the best objectively described, user friendly, and science-based genetic predictions to enhance the profitability of beef cattle producers.

Best Objectively Described = Most Reliable

High quality data

Advanced MBGE system

Sound, scientifically based DNA technology

Goal

Leverage DNA technology to achieve greater and faster accuracy of EPDs for seedstock animals, especially in traits that have expensive or delayed data points.

BIF Guidelines

- *BIF believes that information from DNA tests only has value in selection when incorporated with all other available forms of performance information for economically important traits in NCE, and communicated in the form of an EPD with corresponding BIF accuracy.*

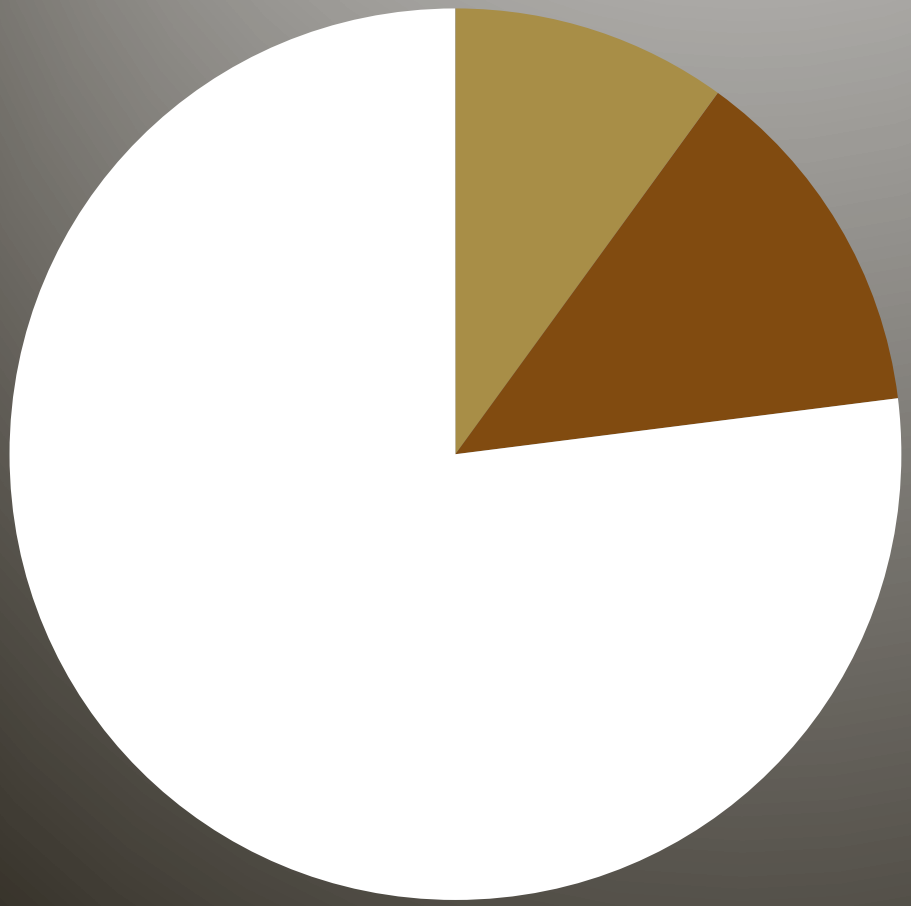
Translation?

- DNA test results (MBVs) are another piece of information, just like weights and ultrasound measurements.
- MBVs only have value when combined with all other available pieces of information to create EPDs for economically important traits.
- MBVs should not be published in addition to their corresponding EPDs.
- The greatest advantage of DNA technology is the rapid increase in accuracy.

Accuracy in Predicting Genetic Merit

ACC = 0.10
(P)

Accuracy in Predicting Genetic Merit



ACC = 0.23

Accuracy in Predicting Genetic Merit

ACC = 0.40

Accuracy in Predicting Genetic Merit

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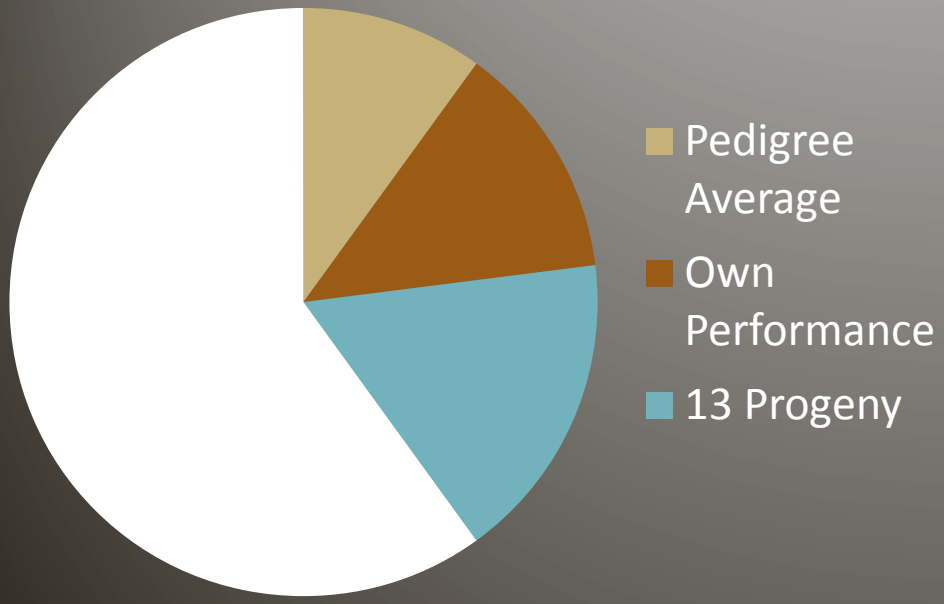
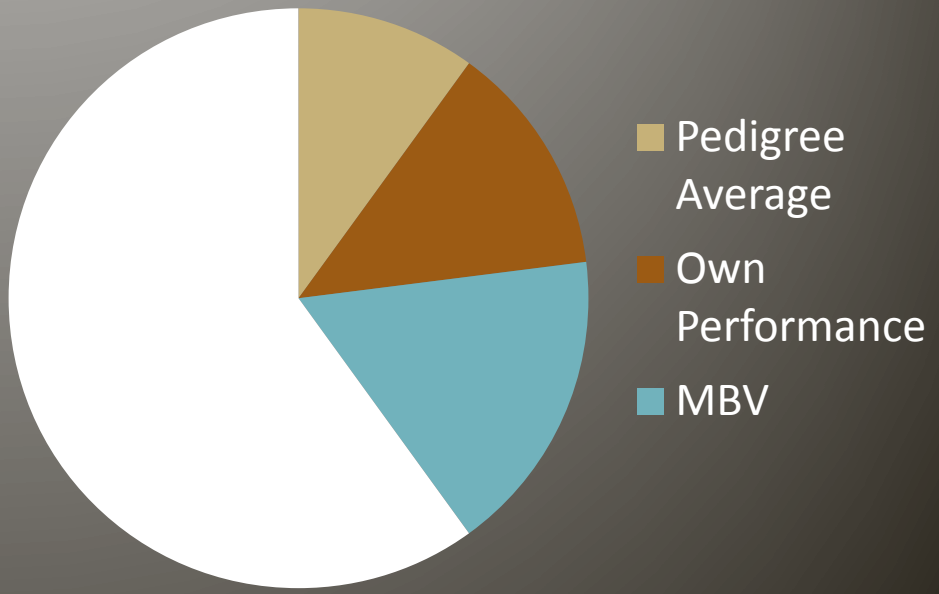
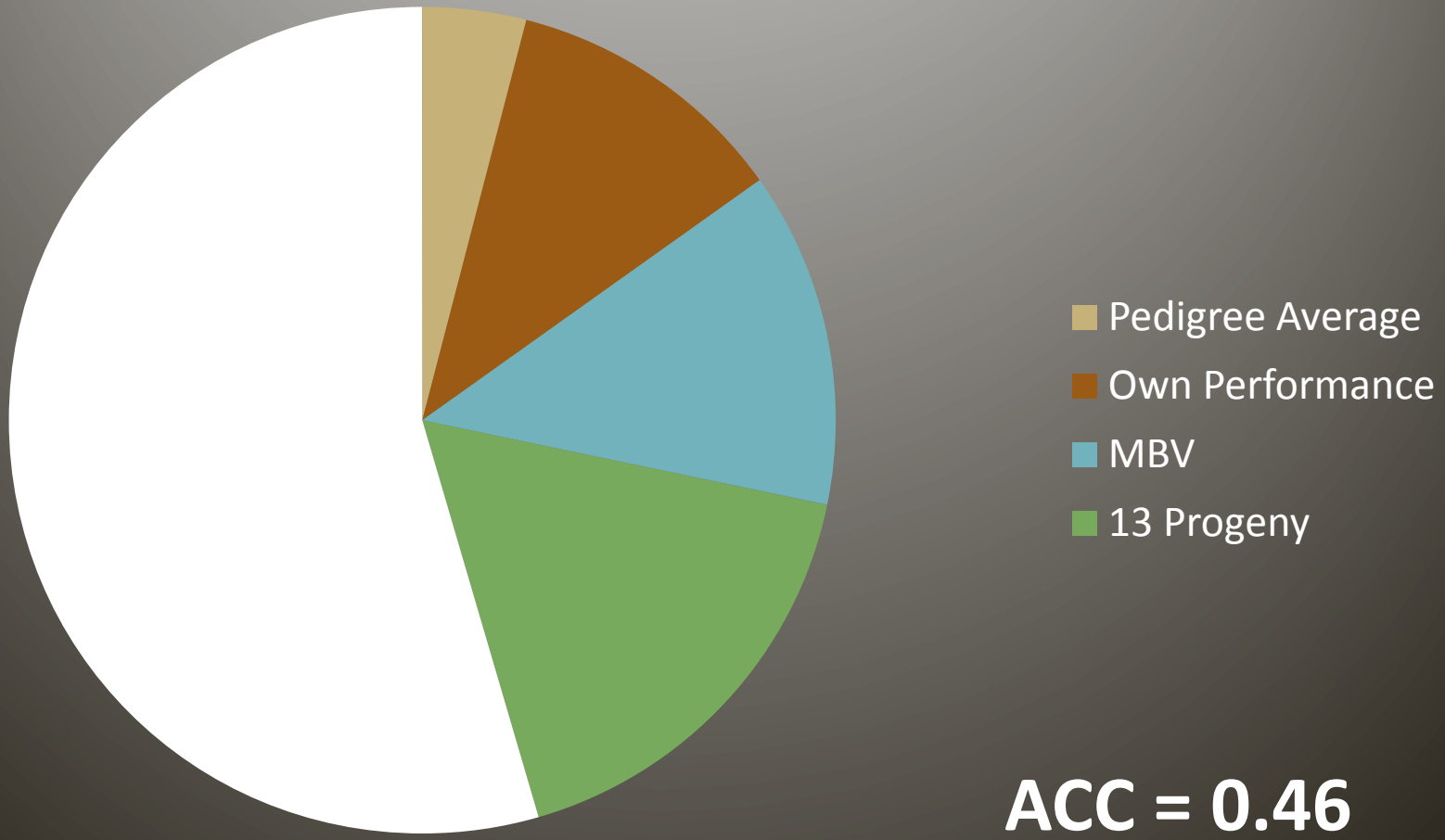
Accuracy in Predicting Genetic Merit





ACC = 0.40

Accuracy in Predicting Genetic Merit

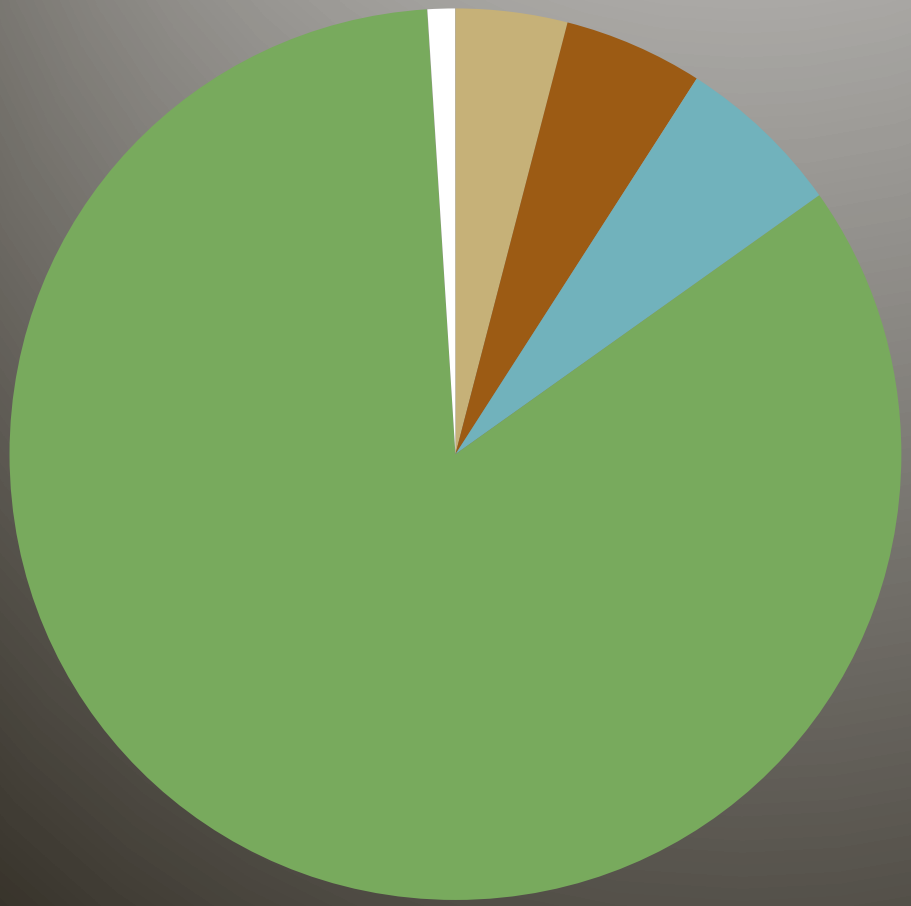


ACC = 0.46

Accuracy in Predicting Genetic Merit

ACC = 0.56

Accuracy in Predicting Genetic Merit



ACC = 0.99

MBV vs Phenotypes

“DNA technology will replace the need to collect phenotypic information”

How do we know if MBV are reliable?

- Validation
- Acquire 50K SNP genotypes on a population of animals independent of discovery population
- Evaluate how well the MBV predicts genetic merit from traditional EPDs or phenotypes
  - Genetic correlation between MBV and the trait

RAAA and ASA MBV Status

- RAAA
  - Collaborating with Pfizer in delivery of DNA technology
  - Additionally, developing RAAA owned MBVs
- ASA
  - Completed development of MBVs
  - Added to interim EPD system
  - Added to MBGE system but needs some fine tuning

Take-Home Messages

- Our priority is to give you reliable EPDs.
- DNA results (MBVs) are just another piece of information, like WW and ultrasound.
- With sufficient %GV, MBVs can increase accuracy on young, unproven animals.
- Phenotypes are still important. Producers must continue to collect performance data.