

# Building Blocks for a Better Genetic Evaluation

2017 ASA Friday Breakout Session  
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# What to Expect in 45 Minutes

- Why performance data matters
- Tips to improve your data reporting
- Discuss genomic testing in relation to genetic evaluation/EPD calculation
- Provoke some thought...for you and for me!



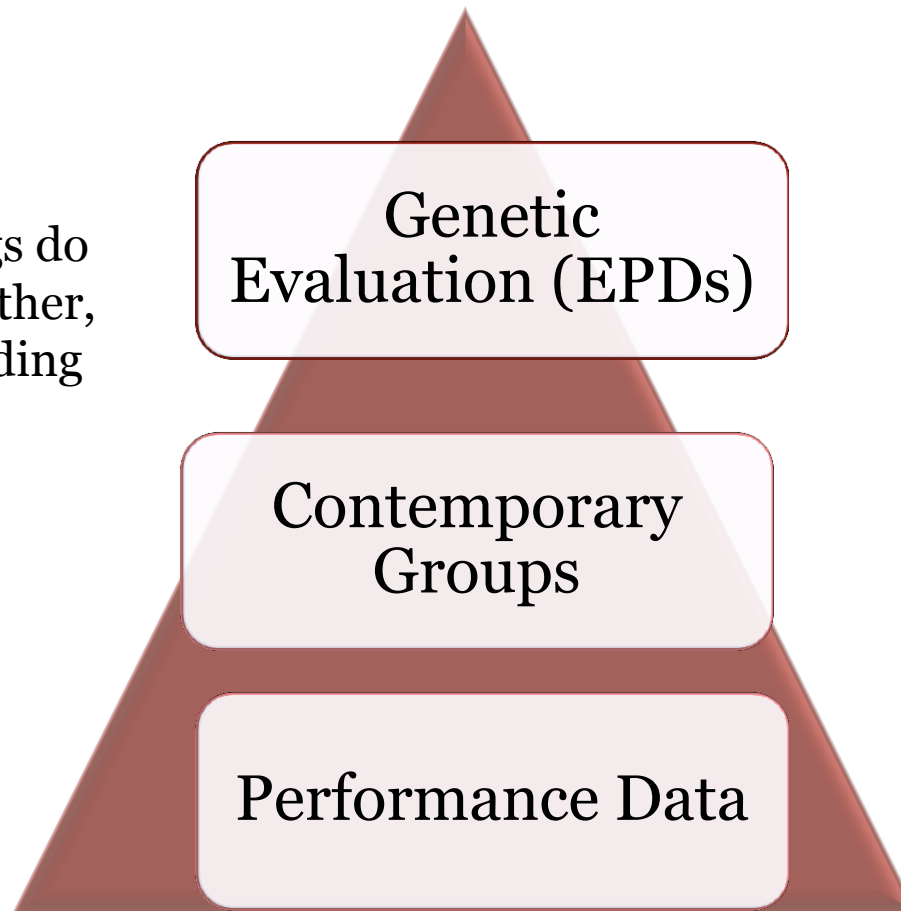
# Genetic Building Blocks

- Basic needs for a strong genetic evaluation
  - Accurate performance data collection
    - Individual measures
  - Complete performance data reporting
    - Contemporary grouping
  - The new “block”: Genomics



# It's NOT a Pyramid Scheme

But these things do  
build on each other,  
much like building  
a pyramid



# Individual Animal Data

- MANY data points we can collect on our cattle
  - Birth Weight & Calving Ease
  - Weaning Weight
  - Yearling Weight
  - Frame Score
  - Ribeye Area
  - Intramuscular fat
  - Carcass Data
  - Calving intervals
  - Body Condition
  - Feed Intake/Conversion
  - The list goes ON...



# Uniform Data Collection

- Treat similar grouped calves the same when collecting data
  - Examples
    - Weigh all your heifers from same pasture on same day
    - Ultrasound all your sale bulls on the same day
    - Use the same scale on all calf birth weights



# Acceptable Data Windows

- There are acceptable age ranges for turning in performance data for some traits
- Plan your data collection to catch all calves in this age range
  - Weaning weight: 100-310 days
  - Yearling weight: 270-500 days
  - Carcass data: 270-500 days
  - Carcass ultrasound (all sexes): 270-500 days



# Adjusted Data

- In Digital Beef, you will see “actual” and “adjusted” measures for some traits
  - WW, YW, REA, IMF in particular
- Why?
  - Adjusted weights are calculated to compare animals on a standard age basis
    - Not every calf in your herd is the same age at weaning
    - Standardizes those weights to compare all at 205 days
    - YW: standardized to 365 days





$$\text{Adj. 205-Day Wean Wt.} = \frac{\text{Wean Wt.} - \text{Birth Wt.}}{\text{Weaning Age}} \times 205 + \text{Birth Wt.} + \text{Age of dam Adj.}$$

$$\text{Adj. 365-day Yrlg. Wt.} = \frac{\text{Final Wt} - \text{Weaning Wt}}{\text{No. of Days Between Wts.}} \times 160 + 205\text{-day Adj. Weaning Wt.}$$

# 205-Day Weight

- Calf born 4/1/17 weighs 74lb
- Weaned 9/10/17 weighing 525lb (193 days)
- $\text{Adj-205} = ((525 - 74) / 193) \times 205 + 74 = 553\text{lb}$
- If calf stayed on the cow until 205 days and gained at the same rate, it would weigh 553lb

# Contemporary Groups

- It's important to collect accurate data
- EQUALLY important to report it correctly
- Why we have Contemporary Groups (CG)
  - To help us compare similar animals' performance
  - To ensure that collected data is used in genetic evaluations correctly



# CG Facts

- Once a CG is built, it can never get larger
- Animals can be removed, but never added to a CG
  - Explains why BW CGs are bigger than WW, YW, etc.
- Combining CGs at a later production phase is not allowed
  - Can not combine 2 BW CGs into 1 WW, YW CG
- These challenges emphasize importance of creating proper CGs from the start



# Keep Them The S.A.M.E.

- I stole this phrase from Patrick Wall...
- When trying to build your contemporary groups, consider keeping them the S.A.M.E.
  - Sex
  - Age
  - Management
  - Environment



# S.A.M.E. Contemporary Groups

- Sex
  - Group your males and females together
  - Digital Beef will do this for you
- Age
  - Depending on your calving season, calves born within 60-90 days should be grouped together
  - Calving season longer than 120 days?
    - Consider splitting your CGs into first and second half
    - Use “Season” option when recording in Digital Beef



# S.A.M.E. Contemporary Groups

- Management
  - Cattle on similar nutrition planes should be grouped together
    - All weaned heifers on pasture
    - All bulls in development lot
  - Cattle with management that varies from the rest of the group should be grouped differently
    - Sale cattle, Show string, Cattle on extra supplement
    - Use “Mgmt” codes in Digital Beef to differentiate cattle with special treatment

# S.A.M.E. Contemporary Groups

- Environment
  - Somewhat coincides with Management
  - Animals raised in similar conditions should be grouped together
    - Same pasture, same farm, etc.
    - Two farms 10 miles apart? Different CGs





# Performance Ratios

- Ratios compare cattle in a CG and their relation to the group average
- 100 is the “average” ratio for the CG
- Animals with ratio  $> 100$  performed better than group avg;  $< 100$  worse than group avg
  - Ratio 105: 5% above avg; Ratio 95: 5% below avg

# What Calves Should I Report?

- True or False: I should not turn in data on my lowest performing calves...
- FALSE!
- Turning in all data gives credit to just how well your top calves performed



# Example

Calf ID	WW	Ratio
15E	620	115
19E	600	111
31E	570	105
69E	550	102
126E	535	99
36E	475	88
7E	440	81
Avg	541	100

Eliminate our poor calves (36E, 7E) and see what happens on next slide...



# Remove the Bottom?

Calf ID	Weight	Ratio
15E	620	108
19E	600	104
31E	570	99
69E	550	96
126E	535	93
Avg	575	100

Makes a difference, doesn't it?



# One Sire or Multiple Sires?

- True or False: I should only use one sire in a contemporary group...
- FALSE!!!
- Having multiple sires in a CG (when possible) allows for some comparison

# More Examples

ID	WW	Sire	Ratio
15E	620	A	115
19E	600	B	111
31E	570	A	105
69E	550	A	102
126E	535	B	99
36E	475	B	88
7E	440	B	81
Avg	541		100

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15E	620	A	115
19E	600	A	111
31E	570	A	105
69E	550	A	102
126E	535	A	99
36E	475	A	88
7E	440	A	81
Avg	541		100

Sire A avg: 541 (100 ratio)

Sire A avg: 580lb (107ratio)

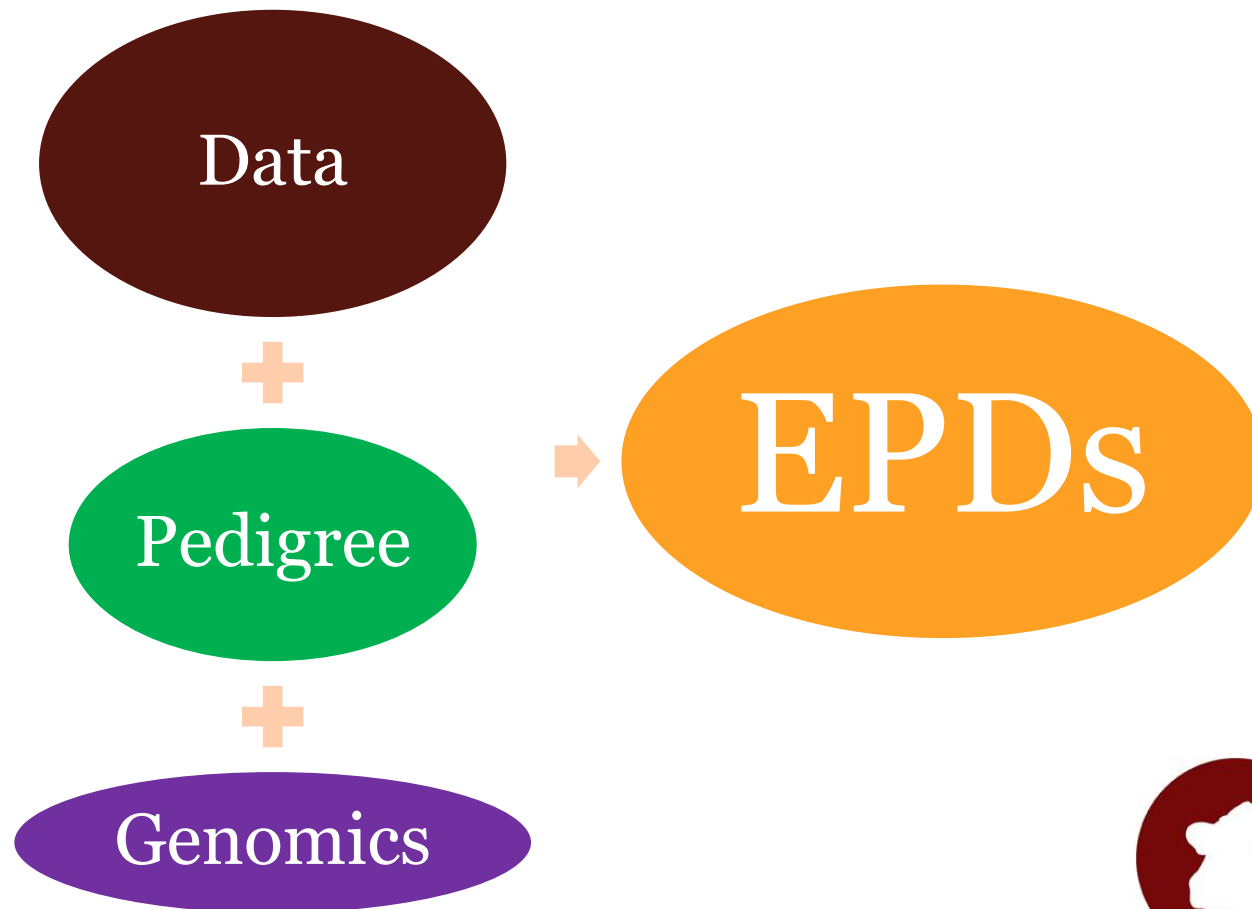
Sire B avg: 513 lb (95 ratio)



# Multiple Sire Groups

- Previous slide tells us what we already knew
  - Progeny from different sires will vary (Sire A vs B)
  - Can't tell how much variation unless we have multiple sires in a contemporary group
- How can we do that?
  - Utilize AI
    - AI your cows to 1 (or more) bulls, then clean up
    - Gives you performance data on several sires in the herd

# Genomics: The New Building Block







# Genomics

- Genomic information is becoming a larger part of our genetic evaluations
  - Genomic tests ID genes/markers that affect performance
  - Effect of presence/absence of markers reflected in genomically-enhanced EPDs
    - Presence of markers X, Y, Z have known positive effect on weaning weight
    - Cattle with X,Y,Z markers present see that reflected in genomically-enhanced EPDs



# A Great Genomic Analogy

- BIF Convention 2017
- The question: Can we rely on just genomics without performance data?

“Genomics are like a credit card. Phenotypes (performance data) are the cash you need to pay off your credit card.”

Translation: we still need data to go with genomics

# Test One? Test Them All?

- Common practice to genomically test “elite” animals in the herd
- Think back to the CG example when we only reported the best... what happened?
- If economically feasible, test your calf crop
  - Minimum: test as many replacements as possible
    - Eventually, whole cow herd becomes tested

# What Are my Options?

- Three options provided by GeneSeek
  - Difference: number of DNA markers analyzed
  - All test provide GE-EPDs
  - 25K (uLD) Test: sale bulls, replacement heifers
    - Least amount of markers; \$40
  - 50K (LD) Test: herd bulls, donors
    - Medium sized number of markers; \$55
  - 150K (HD) Test: highly influential sires and donors
    - Highest number of markers; \$90



# Sampling

- 3 Types of DNA Samples
  - Hair
  - Blood
  - Tissue Sampling Unit (TSU)
    - “New and improved”
- Blood and Hair cards can be ordered from ASA
  - Hair samples will be charged \$2/sample by Geneseek for extra processing

# Tissue Sampling Unit

Both the TSU applicator (blue) and the TSU sample tubes can be ordered where you find Allflex products



# How to Order Tests

- Go to [www.shorthorn.org](http://www.shorthorn.org)
- Download the “DNA Genetic Testing Form” from the “Forms” tab
- Fill it out and send to the ASA office with sample
- Once received at ASA, allow 4-6 weeks for results
- Results will be emailed to you



# Questions?

