Genetic evaluation of beef carcass data using different endpoint adjustments

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Collaborators

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Initial Research

- EPD were calculated
  - Backfat
  - Carcass Weight
  - Marbling
  - Ribeye Area
  - Percent Retail Cuts
- For four different endpoints:
  - Backfat
  - Carcass Weight
  - Marbling
  - Age

Percent Retail Cuts

$$PRC = 51.34 - (5.78 \times Fat) - (0.0093 \times CWT) - (0.462 \times KPH) + (0.74 \times REA)$$
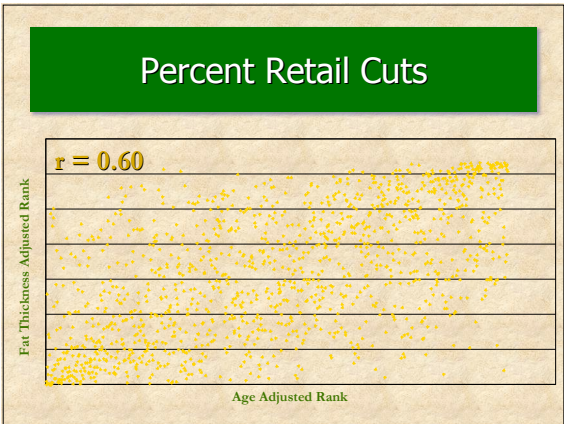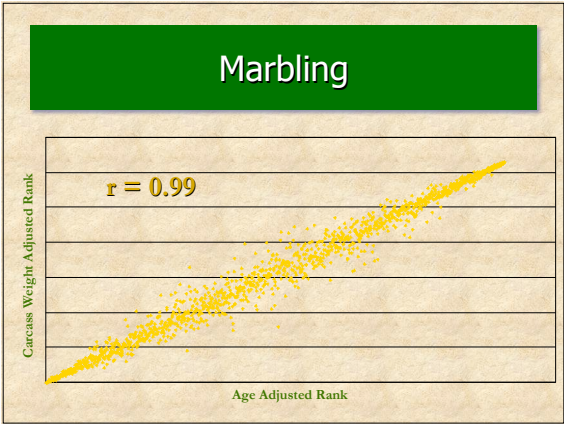
EPD Calculation

- EPD were calculated using data collected from animals born 1992 – 2001 (5,983 – 6,795 records)

$$y = X\beta + Z_a a + e$$

  - Fixed Effects
    - Categorical: Contemporary Group
    - Covariate: Endpoint (Fat, Marbling, Carcass Weight, or Age)

Results

- No matter the endpoint, ranking of sires did not differ
  - Backfat
  - Carcass Weight
  - Marbling
  - Ribeye Area

Marbling

r = 0.99

Carcass Weight Adjusted Rank

Age Adjusted Rank

Percent Retail Cuts

r = 0.96

Carcass Weight Adjusted Rank

Age Adjusted Rank

Percent Retail Cuts

r = 0.60

Fat Thickness Adjusted Rank

Age Adjusted Rank

% Retail Cuts – Heritabilities & EPD

Endpoint	h^2	Sire EPD Range	σ^2_p
Age	0.23 (0.05)	-0.59 to +0.55	$1.57\%^2$
CWT	0.21 (0.05)	-0.53 to +0.52	$1.43\%^2$
Marb	0.20 (0.04)	-0.54 to +0.59	$1.50\%^2$
Fat	0.32 (0.05)	-0.39 to +0.47	$0.75\%^2$

Validation

- Looked at the phenotypes of 822 progeny born 2002 – present

- Fixed Effects
  - Categorical: Contemporary Group
  - Covariate: Linear covariate of endpoint

Results

Endpoint	Coefficient
Age	1.02 (0.43)
CWT	1.16 (0.52)
Marb	0.96 (0.48)
Fat	0.56 (0.52)

Conclusions

- Coefficients support that there is negligible difference between PRC adjusted to most endpoints
  - Marbling
  - Carcass Weight
  - Age

- The fat endpoint is a worse model than the other endpoints

Next Steps…

- Shrink the standard errors
  - Add more carcass data
  - Lessen the proportion of records in the calculation of EPD, increase the proportion in the validation

- Analyze additional breeds
  - British
  - Zebu

Questions?