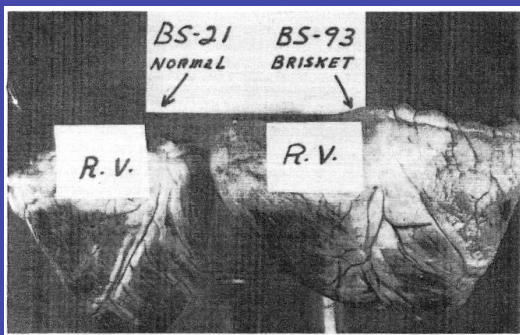


New method for evaluating susceptibility to High Altitude disease

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High Altitude disease

- High mountain or Brisket disease
- Right ventricle hypertrophy and edema of brisket
- Incidence
 - 0.5-5% native cattle
 - 10-40% cattle moved to altitudes >5000 ft



18 and 17 mo of age (Blake, 1965)

Pulmonary arterial pressure (PAP)

- Measure of blood flow resistance
- Reliable predictor of susceptibility
- Test
 - \$10-\$18/test
 - Age >12 mo
 - Altitude 5000 ft
 - Breed, illness and vaccination

Gjermundson, 2000

PAP test

PAP score, mmHg	Evaluation
30 – 35	Excellent, highly reliable
36 – 40	Excellent >12 mo, retest < 12 mo
< 41	Reliable >12 mo
41 – 45	Acceptable >6 mo, retest < 6 mo
45 – 48	Acceptable >6 mo at high altitude for extended period, Some risk
> 49	High risk

Gjermundson, 2000

Objectives

- Is there a maternal component to PAP?
- Is the heritability of PAP different using continuous or binomial scores?

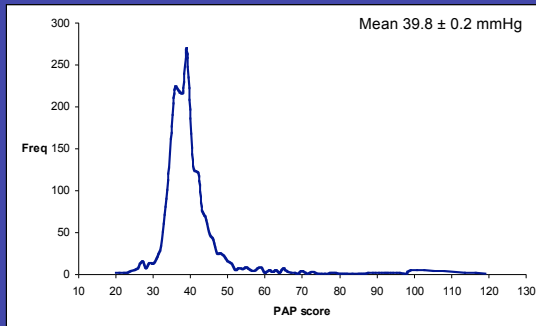
Materials and Methods

- Tybar Ranch, Carbondale, CO (6500 ft)
- American Angus Association
- 2305 Angus born 1984-2003
 - 1088 bulls
 - 1150 heifers
 - 67 steers
- Pedigree 132 sires and 793 dams

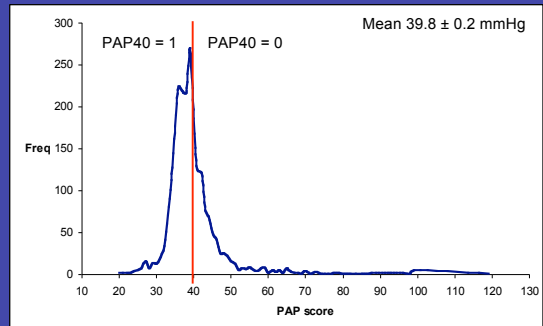
Materials and Methods

- Birth weight and adjusted 205-d WW
- PAP
 - 1 licensed veterinarian
 - Ahola et al. (2006)
 - Age at PAP measurement
 - Continuous or binomial distribution

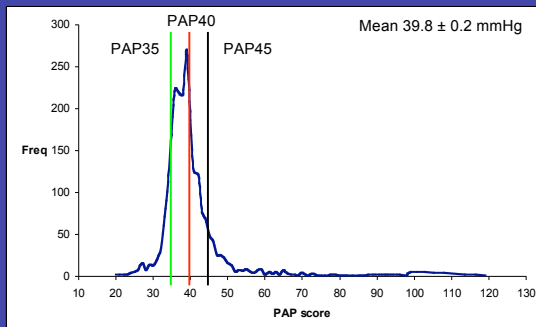
PAP scores



PAP scores



PAP scores



Materials and Methods

- Fixed effects
 - Age of dam
 - Yrsex
 - Age at PAP

Results

- Fixed effects ($P = 0.01$) except AOD
- PAPm
 - Continuous ($P = 0.99$; $h^2 = 0.02 \pm 0.0004$)
 - Binomial ($P = 0.001$)

Results

PAPd $h^2 = 0.34 \pm 0.05$
PAPm $h^2 = 0.02 \pm 0.0004$

	PAP35	PAP40	PAP45
Direct	0.13 ± 0.09	0.28 ± 0.11	0.13 ± 0.11
Maternal	0.07 ± 0.06	0.14 ± 0.06	0.15 ± 0.10
r_g	0.01 ± 0.70	-0.32 ± 0.34	-0.60 ± 0.54

Conclusions

- Maternal effect – Binomial distribution
- PAP40
- Multi-trait analysis using birth weight and weaning weight