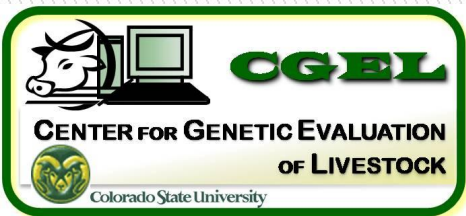


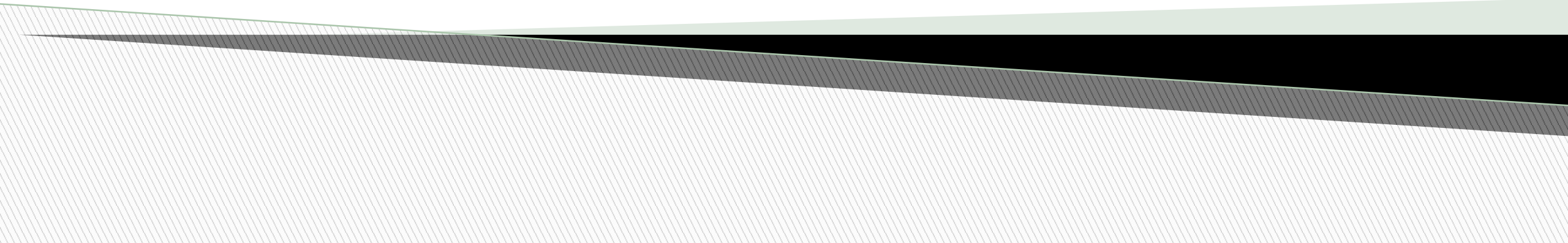


Targeting Bull Selection to Match your Management, Environment and Market

R. Mark Enns, Scott E. Speidel, Tim Holt, and Milt G. Thomas
Colorado State University

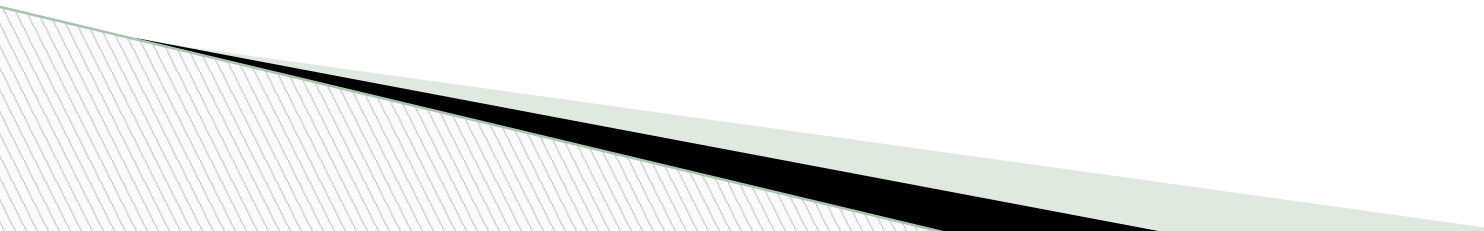


**Overarching Perspective:
Seedstock producers are focused on the
needs of their commercial customers**



The bull selection process—Management, Environment and Market

□ Context for selection:

- How will I market my animals/primary source of income?
 - What are the key production challenges?
 - What are the keys to getting a calf to sale?
 - What are the key cost centers?
- 

The bull selection process—Management, Environment and Market

- How will I market my animals/primary source of income?
 - Sale @ weaning or after backgrounding
 - Yearling/stocker grazing program
 - Retain ownership—market live or on a grid?



Developing the context for selection

□ What are the key production challenges?

- Environmental
 - Fescue Toxicity
 - Heat tolerance
 - Elevation
- Resource
 - Forage quantity/quality (e.g. drought risk)
 - Supplemental feed resources (transportation and/or availability)
- Management
 - Availability of labor

Developing the context for selection

- What are the keys to getting a live calf to sale?
 - Reproduction
 - Survival
- What are the primary cost centers?
 - Feed required

The bull selection process—Management, Environment and Market

□ Context:

- How will I market my animals/primary source of income?
- What are the key production challenges?
- What are the keys to getting a calf to sale?
- What are the key cost centers?

□ Outcomes for selection



The bull selection process—Management, Environment and Market

□ Context:

- How will I market my animals/primary source of income?
- What are the key production challenges?
- What are the keys to getting a calf to sale?
- What are the key cost centers?

□ Outcomes for selection

- Relative emphasis on
 - Weaning weight and milk production
 - WW direct and maternal EPD
 - Post-weaning growth performance
 - Yearling weight EPD
 - Carcass performance
 - Carcass weight, yield grade, marbling EPD

The bull selection process—Management, Environment and Market

□ Context:

- How will I market my animals/primary source of income?
- What are the key production challenges?
- What are the keys to getting a calf to sale?
- What are the key cost centers?

□ Outcomes for selection

- WW-direct and maternal EPD vs YW vs CW, YG and MS EPD
- Heat tolerance and/or fescue toxicity
 - Hair shedding EPD or equivalent
- Pulmonary hypertension (high elevation induced and/or feedlot induced)
 - PAP EPD

The bull selection process—Management, Environment and Market

□ Context:

- How will I market my animals/primary source of income?
- What are the key production challenges?
- What are the keys to getting a calf to sale?
- What are the key cost centers?

□ Outcomes for selection

- Weaning weight and milk vs YW vs CW, YG and MS EPD
 - Hair shedding EPD
 - PAP EPD
 - Other health-related EPD in the future
- Sustained cow fertility
- Stayability
- Calving Ease
- Scrotal Circumference
- Survival/health? (in the future)

The bull selection process—Management, Environment and Market

□ Context:

- How will I market my animals/primary source of income?
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- Scrotal Circumference
- Sustained cow fertility
- Stayability
- Calving Ease
- Feed and Labor
 - Feed intake
 - Mature cow size/maintenance energy
 - Calving ease

The bull selection process—Management, Environment and Market

□ Context:

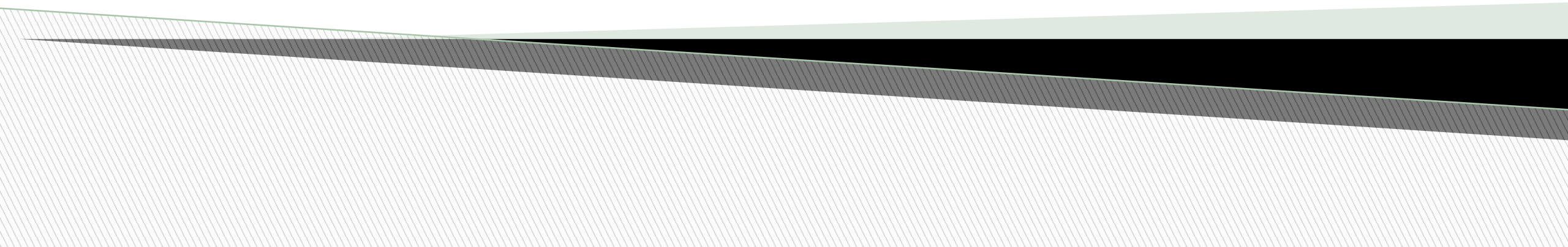
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 - Other health-related EPD in the future
- Scrotal Circumference EPD
- Sustained cow fertility EPD
- Stayability EPD
- Calving Ease EPD
- Mature cow size/maintenance energy EPD
- Calving ease EPD
- Feed intake EPD

Underlying this list is the challenge of multiple trait selection:

The more traits selected on, the slower the rate of genetic
progress in any one trait



**Have created a list of key traits, the
economically relevant traits**

***How do we fine tune the levels of performance?
The diversity of environments is challenging***

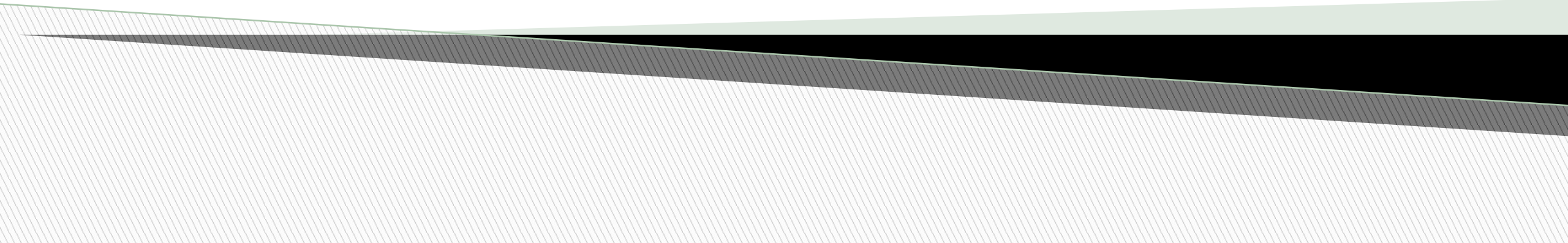
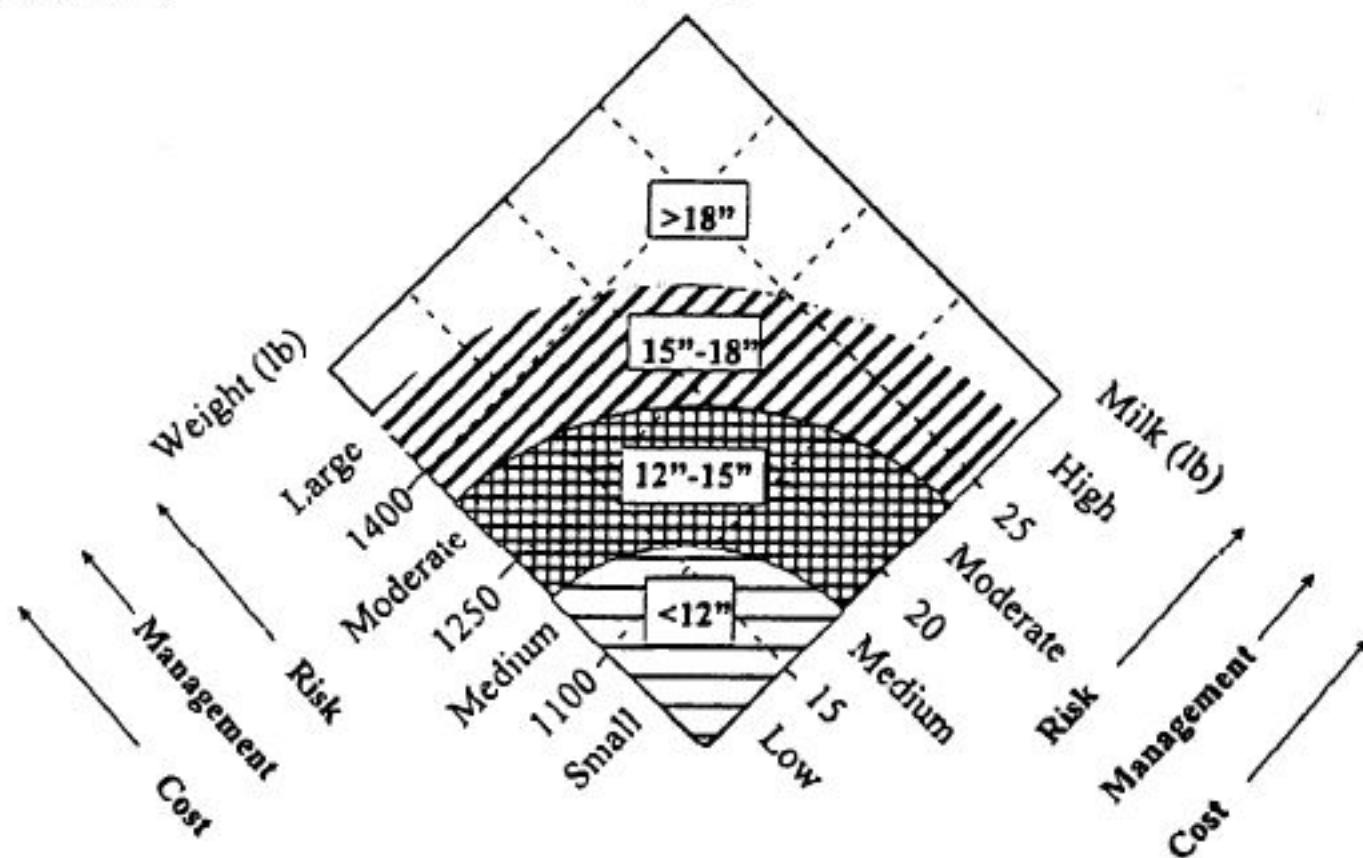
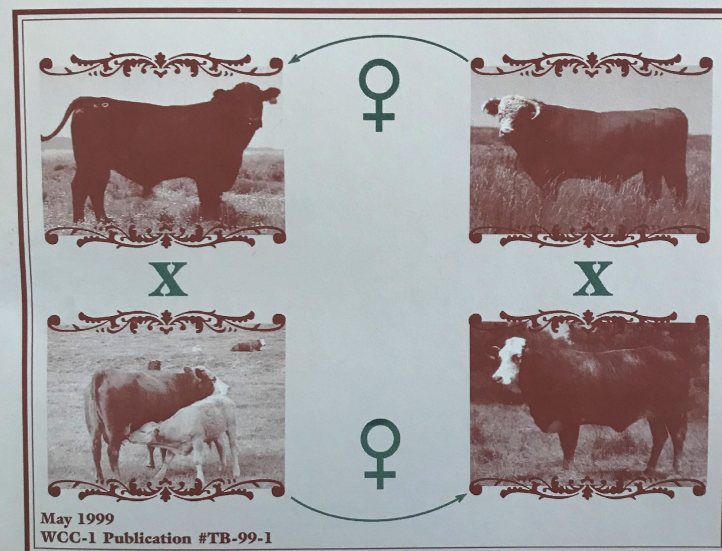


Figure 1. Matching cow biological type (weight and milk) to range environment, with associated risk, management, and cost. Ranges in inches (12"-15") are annual precipitation and/or represent availability of winter feed resource.



CROSSBREEDING BEEF CATTLE FOR WESTERN RANGE ENVIRONMENTS

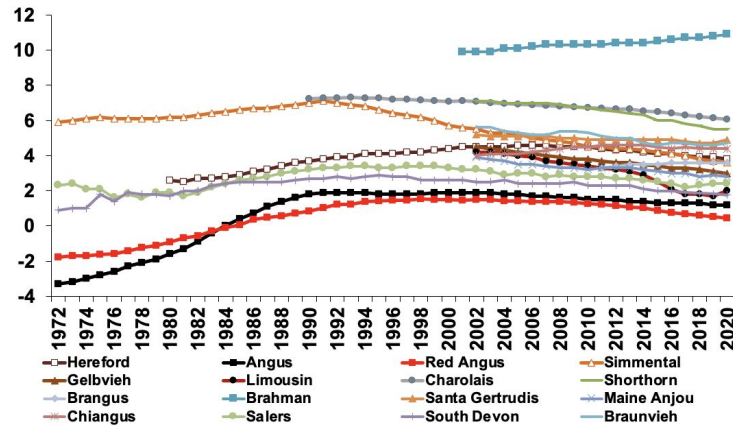
✻ Second Edition ✻



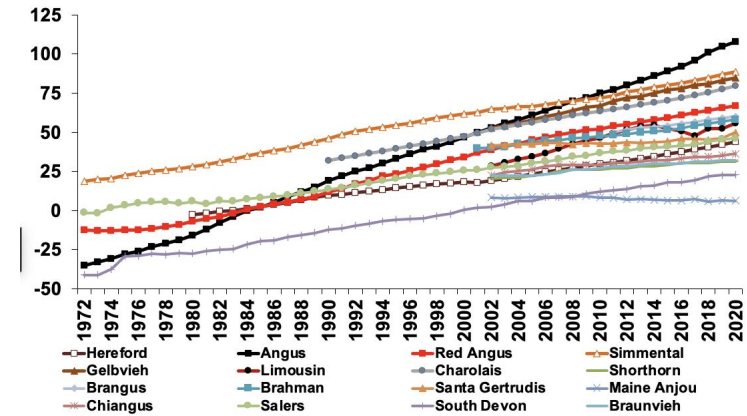
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Montana State University
Bozeman, MT 59717

Our historical thoughts on breed differences have changed over time (thanks to Dr. L. Kuehn for the graphs)

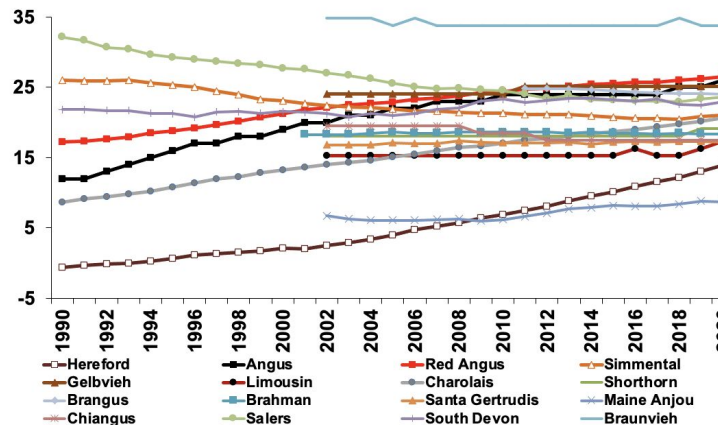
Genetic Trends for Birth Weight, lb



Genetic Trends for Yearling Weight, lb



Genetic Trends for Maternal Milk, lb



Mature size and milk production comments

- Maintenance energy is a function of **both** body weight and milk production
 - Increases in milk production result in increased maintenance requirements throughout the year (Ferrell and Jenkins, 1984)

Cow weight	Metabolic Weight	Percent Increase in Maintenance Requirements
1000	177.8	
1100	191.0	7.4%
1200	203.9	14.7%
1300	216.5	21.7%
1400	228.9	28.7%
1500	241.0	35.5%

Maternal ability, cow size, and longevity/stayability

□ Results are a bit mixed

- Boldt, et al. (2018) reported a positive genetic correlation (.55) between Stayability and milk in Red Angus Database
 - Genetic correlation between post-weaning gain and stayability was -.09 and near zero for weaning weight direct and stayability
- Rogers et al. (2004) risk of culling for pregnancy in Eastern Montana
 - Increased as maternal breeding value increased
 - Decreased as breeding value for mature weight increased
 - ??—function of lower milking cows being able to deposit more fat than higher milking cows
- Genetic correlation of BCS and stayability was .28 in New Zealand environment

Longevity/Stayability Advancements

- Doing better "pulling" longevity/stayability apart
- Teat and Udder Score
 - .30 and .23 genetic correlation with stayability in Red Angus (Boldt et al., 2018)
- Foot scores
 - Rear claw shape and front side view in Red Angus with stayability were -.12 and .16 (Boldt, et al. 2018)
 - L.K. Giess, differences in foot scores account for 5 to 10% of variability in stayability EPD in Red Angus
 - In sheep, rear leg set with longevity genetic correlation was .50. H.Y. Gunes (2022)

Advancements are being made in genetics of environmental adaptability

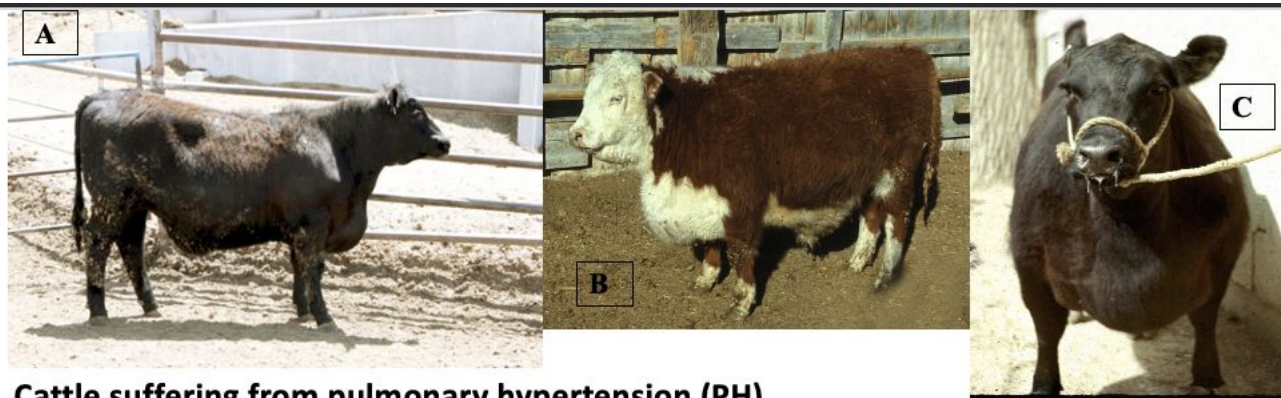


Thanks to Dr. Thomas for photos

Two traits—environmental adaptability

□ Pulmonary hypertension

- Dr. Tim Holt
- PAP EPD
- Heart score EPD in the future



Cattle suffering from pulmonary hypertension (PH).

A = feedlot steer at 4,100 ft elevation (Feedlot Heart Disease; FHD).

B and C = cattle experiencing PH at elevations above 5,000 ft (i.e., High Mountain Disease; HMD).

□ Likely more in the future

- Disease susceptibility (e.g. BRD)

□ Hair shedding EPD



Score 5

0% shed – full winter coat



Score 4

25% shed – lost winter coat around head and neck



Score 3

50% shed – lost hair along topline and farther down brisket compared to a 4



Score 2

75% shed – only holding hair on flanks and around belly



Score 1

100% shed out – no remaining winter coat

***Photographs courtesy of Dr. Trent Smith, Mississippi State University*

Visit AAA Login at [Angus.org](https://angus.org) to submit scores. Call the American Angus Association® team at 816-383-5100 with questions.

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In summary

- Bull selection to match management, environment and market
 - Must focus on the economically relevant traits
 - What are the key traits in your environment?
- Use EPD to fine tune your system to account for environmental challenges and meet your marketing program.
 - Sometimes there is some trial and error required
- Changing sustainability goals
 - Likely increase traits of importance, although **longevity and feed utilization** are high on this list

Questions?

