*ECONOMICALLY RELEVENT TRAITS AND SELECTION INDCIES Matt Spangler University of Nebraska-Lincoln

*P=G+E
*Phenotype = Mean + BV + Environment

*There is more than one trait that impacts the profitability of your herd!

*Fundamentals

- *What are my breeding/marketing goals?

 *What traits directly impact the profitability of my enterprise?

 *Are there environmental constraints?

 *How To Begin?
- *Traits that are directly
 associated with a revenue
 stream or a cost

 *Examples
 *BWT vs CE
 *REA vs YG
 *YWT vs CWT
 *MWT vs DMI
 *RFI vs FI

 *RELEVANT Traits
- *Many ERTs are not currently evaluated nor collected routinely in the seedstock sector

 *However, they drive value downstream

 *Reproduction phenotypes (longevity)

 *Disease (pulls, treatments, mortality)

 *"Routine" carcass data

 *Plant value—primal yield, dark cutters, blood splash, etc.

 *Value Discovery of Added Information
- *Traits that are genetically correlated to an ERT

 *Why use indicator traits?

 *Measured earlier in life

 *Cheaper/easier to measure

 *Measured on both sexes

 *Coheritability > heritability of ERT

 *Indicator Traits

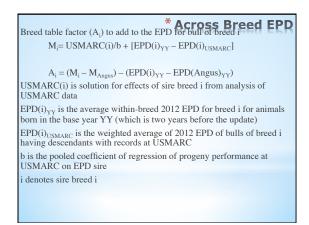
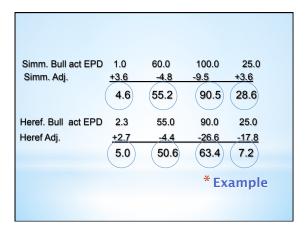


TABLE 1: ADJUSTMENT FACTORS TO ADD TO EPDs OF EIGHTEEN DIFFERENT BREEDS TO ESTIMATE ACROSS BREED EPDs											
Breed	Birth Wt. (lb)	Weaning Wt. (lb)	Yearling Wt. (lb)	Maternal Milk (lb)	Marbling Score ^a	Ribeye Area (in²)	Fat Thickness (in)	Carcass Wt.(lb)			
Ingus	0.0	0.0	0.0	0.0	0.00	0.00	0.000	0.0			
lereford	2.7	-4.4	-26.6	-17.8	-0.32	-0.10	-0.053				
Red Angus	3.4	-25.7	-30.9	2.4	-0.32	0.03	-0.023	-6.2			
Shorthorn	5.1	-30.7	-12.3	4.6	-0.24	0.31	-0.107	-11.6			
South Devon	3.6	-8.0	-25.9	2.4	-0.09	0.21	-0.129	-22.3			
Beefmaster	5.7	36.1	32.3	11.9							
Brahman	10.9	47.5	9.2	23.6	-0.83	-0.11	-0.146	-28.5			
Brangus	3.9	13.9	5.1	4.6				-12.5			
Santa Gertrudis	6.9	41.4	42.2	14.2	-0.62	-0.06	-0.097	-5.4			
Braunvieh	2.5	-22.1	-49.3	-0.4				-44.9			
Charolais	8.6	39.6	40.8	7.3	-0.39	0.98	-0.207	5.4			
Chiangus	3.5	-26.9	-38.8	0.2	-0.40	0.34	-0.114	-20.9			
Selbvieh	2.7	-21.5	-30.4	1.6	-0.33	0.65	-0.117	-22.6			
imousin	3.0	-17.0	-42.0	-8.8	-0.60	0.98		-13.4			
Maine-Anjou	5.0	-24.5	-35.0	-3.6	-0.60	0.78	-0.192	-23.6			
Salers	2.2	-4.1	-26.3	4.9	-0.14	0.85	-0.203	-29.7			
Simmental	3.6	-4.8	-9.5	3.6	-0.38	0.43	-0.137	3.8			
arentaise	3.1	28.3	9.6	23.4							



*Scaling of threshold traits

*Correctly accommodating the differences in models used by various beef breed associations

*For CE All breeds use a multi-trait model fitting BWT but some use a linear-linear and some use a threshold-linear

*Some breeds combine categories

*Mean incidence of difficulty (e.g. 50%, 80%, etc.)

- *Calf survival

 *Male fertility

 *Disease susceptibility

 *Calving ease direct

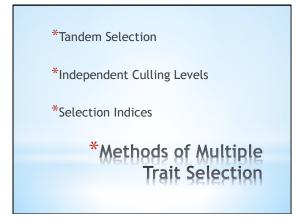
 *Growth rate

 *Feed efficiency

 *Carcass quality/composition

 *Terminal Sires—Traits of Importance
- *Female fertility
 *Maternal calving ease
 Maintenance requirements
 *Longevity
 Maternal weaning weight (Milk)
 *Disease susceptibility
 *Adaptation
 *Temperament

 *Maternal Traits of Importance

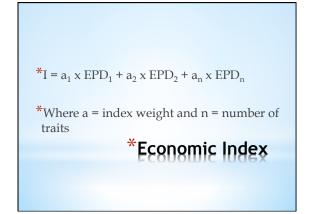


INDEPENDENT CULLING LEVELS

CED = 2.1 WW = 43 MM = 18 SC = 0.9 IMF = 0.04

	CED	ww	MM	SC	IMF	\$BMI
1	2.5	55	20	1.0	0.10	20.16
2	5.0	50	25	1.2	-0.10	19.55
3	4.0	45	20	1.0	0.25	20.35
4	1.6	62	19	1.0	0.20	21.64

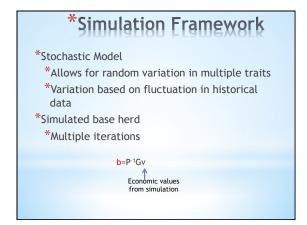
Moser, 2005



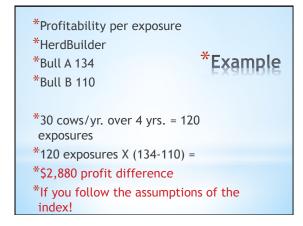
*[Dam Weight*Lean Value of Dam + No.
Progeny*Progeny Weight*Lean Value of
Progeny] - [Dam Feed*Value of Feed for Dam +
No. Progeny*Progeny Feed*Value of Feed for
Progeny].

*By simply increasing number of progeny per
dam through either selection, heterosis from
crossing, or better management, we will
increase efficiency of production.

*Improving Efficiency



*Terminal or Maternal? **Terminal** Maternal •\$B, \$F, \$G (Angus) •\$W, \$EN (Angus) •TI (Simmental) API (Simmental) CHB\$ (Hereford) •BMI\$, BII\$, CEZ\$ MTI (Limousin) (Hereford) EPI and FPI (Gelbvieh) •HerdBuilder (Red Charolais Angus) GridMaster (Red •\$Cow (Gelbvieh) Angus)



*Improvement in current indices can be made by increasing the number of ERT that have EPD

*Input traits

*Fertility

*Enterprise level profitability should move closer to industry level profitability

*Example: What is the direct economic benefit for a producer to improve tenderness?

*Establish production goals

*Use economic indices that fit your desired breeding objectives

*Do not make sire selection more cumbersome than it needs to be

*Summary

Know your costs
 Select on PROFIT not just revenue
 Multiple trait selection is critical and could become more cumbersome
 Economic indexes help alleviate this
 Use index values that meet your breeding objective

*Summary

*http://beef.unl.edu
*www.beefefficiency.org
*www.nbcec.org
*www.eBEEF.org

*Helpful Resources