

Evaluation of Beef Cattle Performance Data

Major Production Traits

- Reproductive performance
- Mothering ability
- Growth rate
- Efficiency of gain
- Carcass merit

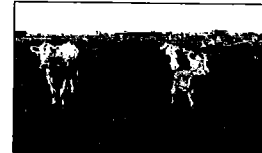
- Both individual and herd performance records are important

Herd Performance

- Overall productivity and direction
- Relate to profitability
- **Percentage calf crop**
 - Number calves weaned
 - Number cows exposed to AI or bull
 - All females considered
- **Calving distribution**
 - 21-day periods
- **Weaning weight per cow exposed**
 - Weaning weight and % calf crop

Individual Records: Reproductive Performance

- Assist in selection and culling decisions within herd
- **Calving Interval**
 - # days from when cow calves until she calves again
 - 365 days or less ideal
 - > 385 days
- **Birth weight**
 - 60-90 lbs
 - Adjusted for age of dam

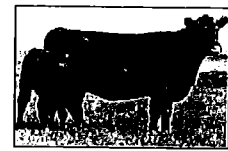


Individual Records: Reproductive Performance

- **Calving Ease Code (CE)**
 - 1 (No assistance) – 5 (Abnormal presentation)
- **Pelvic area**
 - Measured on bulls and replacement females
 - Indicator of calving ease
- **Scrotal Circumference (SC)**
 - Measured at one year of age
 - Adjusted to 365 days and for breed
 - Indicator of fertility (bulls and his daughters)

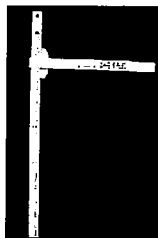
Individual Records: Mothering Ability

- **Weaning Weight**
 - Measure of cow's mothering ability
 - Highly correlated with milking ability
 - Measured at or adjusted to 205 days
 - Avg: 500 lbs (heavier for bull calves)
 - Adjusted for age of dam
 - 5-10 yr old cow as base



Individual Records

- **Yearling Weight**
 - Measured at or adjusted to 365 days
 - Avg: 850 lbs (heavier for bulls)
- **Hip Height**
 - Used with age to calculate frame score
 - Weaning: adjusted to 205 days
 - Adjust for age of dam also
 - Yearling: adjusted to 365 days



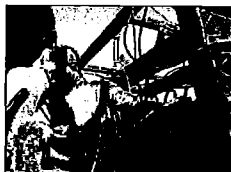
Individual Records: Growth Rate and Feed Efficiency

- **Weight per Day of Age (WDA)**
- **Average Daily Gain (ADG)**
 - Feedlot: 2.5-3.0 lbs/day
 - Heifer development: 2.0 lbs/day
 - Bulls on test: 3.0+ lbs/day
- **Feed Efficiency (F:G)**
 - Feedlot: 7 lbs feed: 1 lb gain



Individual Records: Carcass Merit

- **Seedstock and cow-calf producers**
 - Ultrasound measurements and carcass EPDs
 - Ultrasound measurements of both bulls and replacement females
 - Ribeye area
 - 12th rib fat
 - Marbling
 - Adjusted to 365 days



Ratios

- **Ratios calculated for:**
 - Birth weight
 - Weaning weight
 - Yearling weight
- **Indexes utilized for performance testing**
 - Normally include WDA, ADG, and F:G

Expected Progeny Differences (EPDs)

- Expressions of relative genetic merit
- Allows comparison between 2 or more animal to predict progeny performance
- Comparison must be between animals of the same breed
- Expressed in unit that the trait is measured in
- Can be used by commercial and purebred producers

EPDs to Predict Calving Ease

- **Birth weight (BW)**
 - Expressed in pounds
 - More problems generally associated with heavier calves at birth
- **Calving Ease (CE)**
 - Expressed as percent unassisted births
 - Direct
 - How easily bull's calves will be born
 - Maternal
 - How easily bull's daughters will deliver calves

Birth Weight (BW) EPD

Bull A	-3.0
Bull B	+5.0

Bull A's calves would be expected to be 8 lbs lighter at birth compared to Bull B



Calving Ease (CE) EPDs

	<u>Direct</u>	<u>Maternal</u>
Bull A	+3.0	-1.0
Bull B	-1.0	+2.0

Bull A's calves should be born with 4% fewer assisted births than Bull B's calves.

Bull B's daughters should have 3% fewer assisted births than Bull A's daughters.

EPDs to Predict Maternal Ability

- **Milk**
 - Expressed as pounds of calf at weaning due to milk (not pounds of milk)
 - Differences in weaning weight due to daughter's milking ability



Milk EPD

Bull A	+15.0
Bull B	+ 7.0

Bull A's daughters can be expected to wean 8 more lbs of calf due to milking ability compared to Bull B

EPDs to Predict Maternal Ability

- **Total Maternal**
 - Also known as Maternal Weaning Weight or Milk and Growth
 - Pounds of calf weaned by the daughters of a given bull or female
 - Reflects an individual's ability to transmit both milk and growth rate
 - Calculated by adding an animal's Milk EPD to ½ of its WW EPD

EPDs to Predict Growth Rate

- **Weaning Weight (WW)**
 - Pounds of calf at 205 days of age
 - Predicts differences in weight due to growth genetics, not mother's milking ability
- **Yearling Weight (YW)**
 - Pounds of weight at 365 days of age
 - Best indicator of pure growth

WW and YW EPDs

	<u>WW</u>	<u>YW</u>
Bull A	+30	+60
Bull B	+10	+20

Compared to Bull B, Bull A's calves can be expected to be 20 lbs heavier at 205 days of age and 40 lbs heavier at one year of age.

EPDs to Predict Carcass Traits

- **Ribeye Area (REA)**
 - Square inches of loin muscle area
- **Backfat (BF)**
 - Inches of fat at the 12th rib
- **%IMF or Marbling (IMF or Marb)**
 - Breed differences in this EPD
 - Difference in adjusted 365-day IMF score, based on ultrasound
 - Marbling Score, estimated from actual carcass data
- **Percent Retail Product (%RP)**
 - Angus Association
 - Combines HCW, fat thickness, REA, and KPH into composite
 - Estimate of carcass cutability, predicts difference in cutability

Carcass Trait EPDs

	<u>BF</u>	<u>REA</u>	<u>%IMF</u>
Bull A	+.05	+.50	+.25
Bull B	-.05	+.10	-.25

When comparing the feedlot cattle sired by Bull A and Bull B, Bull A's progeny should have:
 .10 in more backfat
 .40 sq in more REA
 Higher amount of IMF (50% more when mated to average cow)

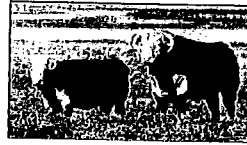
Other EPDs for Beef Cattle

- **Scrotal Circumference**
- **Gestation Length**
- **Yearling Hip Height**
- **Mature Daughter Height and Weight**
- **Stayability**
 - Predicts the probability that a bull's daughter will remain in the herd until 6 yrs of age, given she calved as a 2-yr old

Beef Cattle Performance Data: Interpreting Scenarios

Beef Breed Importance

- British Breeds (Angus, Hereford, and Shorthorn)
 - Generally maternal
 - Cowherd base
 - Improved marbling



Beef Breed Importance

- Beef Marketing Programs
 - Certified Angus Beef

<http://www.cabpartners.com/facts/index.php>

- Certified Hereford Beef

http://www.herefordbeef.org/AHA/tabID__3512/tailored.aspx

Beef Breed Importance

- Continental Breeds (Charolais, Simmental, Limousin, Maine-Anjou, Gelbvieh, etc.)
 - Generally terminal
 - Improved growth rate and efficiency
 - Improved cutability (less fat, more muscle)



Beef Breed Importance

- Bos Indicus ("Earred cattle")
 - Known for heat and insect tolerance
 - Meat tenderness problems with more than ¼ Bos indicus blood



British Breeds

- Angus (Black or Red)
 - Most predominant breed in U.S. (Black)
 - Very maternal with excellent marbling ability
- Hereford (Horned and Polled)
 - Crossed with Angus to produce "black baldy's"
 - Hearty and efficient



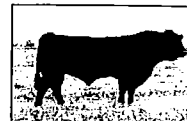
British Breeds

- Shorthorn
 - Fewest of the British breeds
 - Good maternal and marbling ability



Continental Breeds

- Limousin
 - Extremely muscular and lean
- Simmental
 - Fast growing and excellent milkers
- Charolais
 - Fast growing with good carcass traits



Bos Indicus Breeds

- Brahman
 - Most prevalent in U.S.
 - Crossed with Continental or British breeds to form other breeds



Brahman x Angus = Brangus
Brahman x Hereford = Braford
Brahman x Simmental = Simbrah

Bos Indicus Breeds



Braford



Brangus



Simbrah

Beef Production Systems

- Rotational, Terminal, and Rotaterminal crossbreeding systems utilized
- Purebred/Registered
 - Over 70 breeds in U.S.
- Composites
 - Genetically designed crossbred
 - Maintain heterosis while utilizing complimenting breeds
 - Examples: Lim-Flex, Simbrah, Santa Gertrudis, many more

Interpreting Scenarios

- Situation Statements
- Outlines intended use for animals
- Different types of information included
- Some traits may be superior under one set of circumstances, but could be a liability under another
 - Purpose
 - Conditions
 - Selection Priorities

Interpreting Beef Cattle Scenarios

- Type and amount of resources available
 - **Limited feed:** easy fleshing cattle that require less feed requirements (i.e. average Milk, limit mature cow size)
- In bull classes, cow size, age, and breed type bulls will be used on
 - Heifers: low birth weight bull
 - Smaller, lighter weight British type cows: low birth weight
- Amount of labor available
 - **Limited Labor:** emphasis on calving ease

Interpreting Beef Cattle Scenarios

- Marketing Plan
 - Calves sold at weaning: WW important
 - Replacement females kept: growth and maternal traits important
 - Calves maintained in feedlot: YW, ADG, and carcass traits important

Simmental Bulls

Rank these bulls to be used in a 3-breed rotation with Hereford and Angus females. Heifer calves are not retained and all male offspring will be sold as feeders. Feed and labor minimal.

Priorities:

- Average frame size and milk production
- Preweaning growth
- Calving ease

Simmental Bulls

	CED	BW	WW	YW	Milk	Frame
1	+6.5	-1.5	+33	+60	+3.0	6.5
2	+6.1	+1.0	+30	+58	+3.8	7.0
3	-1.0	+3.1	+35	+62	+6.0	8.0
4	+5.9	+1.5	+32	+56	+4.5	6.2
Breed Avg	+5.9	+1.5	+32	+56	+4.9	

Angus Heifers

Rank these heifers to be used in a purebred herd. Females are retained and bulls are sold in the state bull test. All other offspring are sold at weaning. Feed and labor are average.

Priorities:

- Balanced trait
- Calving ease

Angus Heifers

	CED	BW	WW	YW	Milk	SC
1	+2	+5.6	+38	+68	+10	+.15
2	+5	-0.9	+36	+65	+20	+.21
3	+3	+1.5	+30	+55	+18	+.20
4	+4	+2.3	+45	+72	+19	+.30
Breed Avg	+3	+2.4	+35	+65	+17	+.20

Limousin Bulls

Rank these bulls to be used in an Angus based cowherd. All offspring are fed out in retained ownership.

Priorities:

Growth

Muscle (Ultrasound or visual)

Limousin Bulls

	BW	WW	YW	Milk	REA	BF
1	+1.0	+32.1	+70	+20	12.8	.40
2	-0.8	+40	+74.2	+19	13.4	.38
3	+2.0	+45	+81.3	+19.5	15.6	.33
4	+2.3	+42.1	+79.4	+15	14.5	.25
Breed Avg	+2.1	+38.8	+73.1	+19.2		