

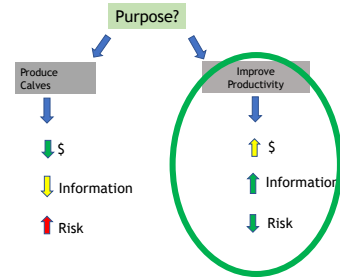
# Improving Productivity Through Bull Selection



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 Extension Livestock Specialist

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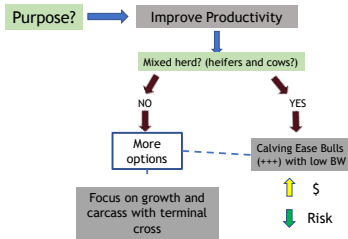
## WHAT IS YOUR GOAL FOR YOUR COW HERD?



## STEP #1

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## Finding the right bull....



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## INFORMATION IS POWER....

More data that is available with a bull, the lower the purchase risk

- ✓ Breed Soundness Exam
- ✓ Trichomoniasis Tested
- ✓ Health History
- ✓ Structure
- ✓ Actual Performance Data
- ✓ Genetic Information
  - ✓ EPDs
  - ✓ Genomics

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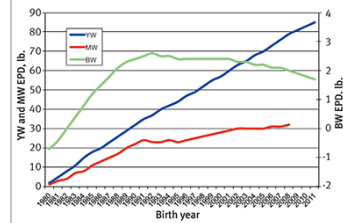
## GENETIC IMPROVEMENT

- HOW QUICKLY CAN YOU ACHIEVE IT?
  - Next to ET, AI is one of the best tools that can help you gain genetic improvement in one generation

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Only 30% of producers utilize EPDs in their decision making process....

Fig. 3: Avg. genetic trend, by birth year, for birth weight (BW), yearling weight (YW) and mature weight (MW)



Source: American Angus Association database.

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## EPD's are a great tool for your selection tool kit!



**9-5 J-C VALICURANTEED 2268**  
 Birth Date: 02/26/2023    Birth Weight: 2268 lbs

EPD	EPD	EPD	EPD	EPD	EPD
Birth	Weight	Gain	Milk	Udder	Score
0.1	11.2	1.1	1.1	1.1	1.1

Owner: J-C Angus  
 \* Powerful, big-stud Guarantee son with top 10% WW and YW top 10% Rib eye EPDs. Dam Prod. 2/11 Wtts, 1/100 Wtts. Recommended for cross only.



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- Will he throw big calves?
- Will he improve my weaning wts?
- How much milk will his daughters produce?
- Will he improve the muscling of my calves?

## EPD Expected Progeny Difference

- ▶ The predicted performance of the future offspring of an animal for a particular trait, calculated from measurement(s) of the animal's own performance and/or the performance of one or more of its relatives.



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## EPD Expected Progeny Difference

$EPD_{iGC} = \sum_{j=1}^n a_{ij} \hat{\mu}_j(EG)$

EPD	EPD	EPD	EPD	EPD	EPD
Birth	Weight	Gain	Milk	Udder	Score
0.1	11.2	1.1	1.1	1.1	1.1



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## Heritability:

Total variation (genetic and environmental) caused by additive gene effects.

- ▶ Phenotypic ("photo") differences between the offspring and the parents
- ▶ *The more heritable the trait the quicker the rate of improvement*

**STEP #2**  
 Select/make a list EPD traits that will help meet your production goals



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## Heritability Estimates and Their EPDs

### Selecting For Replacements

Reproduction	EPD	+ or -	% Heritability
Fertility	SC	+	0-10
Heifer Pregnancy (A/RA)	HP/HPG	+	20-25
Longevity (RA/Herf)	Stay/SCF	+	0-10
Birth Weight	BW	-	35-40
Calving Ease	CE(D)	+	20-30
Milk	Milk	+	25-30
Cow Maternal Ability			40-50



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## Heritability Estimates and Their EPDs

### Selecting For Growth

Production	EPD	+ or -	% Heritability
Weaning Weight	WW	+	25-30
Post Weaning Gains			40-45
Post Weaning Gains (pasture)			30-35
Yearling Weight	YW	+	50-55
Feed Efficiency	rADG/RFI	+/-	35-40



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Heritability Estimates and Their EPDs

Selecting For Growth AND Retained Ownership(?)			
Carcass	EPD	+/-	% Heritability
Carcass Weight	CW	+	40-50
Ribeye Area	RE(A)	+	60-65
Marbling	Marb (IMF)	+	50-60
Fat Thickness	Fat	-	40-45
% Retail Product			25-30

ACCURACY OF AN EPD

► Accuracy ... Along with the calculated EPD is an accuracy value which is a measure of the reliability of the calculated EPD and reflective of the amount of information available used in the calculation. It is a relationship between the calculated EPD of the animal and the true EPD of the animal.

Breed	Performance					Maternal		Carcass		\$ Values		n of 12/22/2016					
	CEW	BW	WW	YW	MIK	HP	SC	Doc	CEM	Marb	RE		FAT	CW	HP	DOC	YLD
ANGUS	11.1	1.9	127	176	11.27	1.4	-0.86	11.4	-11	1.24	-1.09	-1.53	-0.66	-1	148.79	-14.32	144.12
BRAUN	22	36	21	18	85	17	24	85	11	1.1	1.1	2.9	22	29	14		
RED AN																	
SW																	-25.87
MI																	+88.44
MR																	+62.19



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Angus Sire Summary EPDs as of 03/23/23

EPD	CEW	BW	WW	YW	RADG	DMI	YH	SC	DOC	Claw	Angle	HS	PAP	HP	CEM	Milk	MW	MH	SEN	CW	Marb	RE	Fat
Acc	0.76	0.92	0.93	0.83	0.44	0.44	0.78	0.81	0.68	0.49	0.5	0.25	0.25	0.26	0.32	0.33	0.45	0.44		0.51	0.45	0.46	0.48
% Rank	10	20	15	4	2	100	80	30	4	85	75	60	85	50	65	20	40	50	70	75	50	55	55
Actual		BW = 91	WW = 759	YW = 1434																	Marb = 4.62	REA = 18.2	

Ratios and Percentiles

How does the bull rank among his contemporaries???

Top Pct	Production															Percentile Breakdown							
	CEW	BW	WW	YW	RADG	DMI	YH	SC	DOC	HP	CEM	Milk	MW	MH	SEN	CW	Marb	RE	Fat				
1%	17	-3.1	81	143	0.37	-0.84	1.2	2.15	33	17.7	16	39	88	1.1									
2%	36	-2.8	78	138	0.35	-0.87	1.1	1.95	32	16.8	15	37	80	1									
3%	15	-2.2	76	133	0.34	-0.57	1.1	1.83	30	16.3	15	36	76	1									
4%	14	-2	74	131	0.33	-0.51	1	1.76	29	15.8	15	35	72	0.9									
5%	14	-1.8	73	128	0.32	-0.46	1	1.69	29	15.5	14	34	69	0.9									
10%	12	-1	68	121	0.29	-0.3	0.9	1.47	26	14.3	13	32	60	0.7									
15%	11	-0.5	65	115	0.28	-0.2	0.8	1.33	24	13.5	12	30	54	0.6									
20%	11	-0.2	63	111	0.26	-0.11	0.7	1.22	22	12.9	12	29	49	0.6									



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**INDEX Values:** Formulas that are a compilation of data tied to economic factors. Several traits are combined into one value.

**ANGUS:**  
 \$M = Herd replacement value for retained heifer progeny (CE, WW, Milk, HP, Doc, MCW, Foot)  
 \$W (Weaning) = BW + WW + Maternal Milk + Mature Cow Size  
 \$EN (Cow Cost) = Lactation Energy Requirements + Mature Cow Size + \$ of energy requirement  
 \$B (Beef) = WW+YW+DMI+Carcass data + Grid value data  
 \$C (Combined) = the kitchen sink....

**HEREFORD:**  
 \$BMI (Baldy Maternal) = Sustained Cow Fertility (WW + Maternal Milk + Mature Cow Size) - DMI + CW  
 \$BIII (Indicus X) = Sustained Cow Fertility (WW + Maternal Milk + Mature Cow Size) - DMI + CW  
 \$CHB (Cert. Hereford Beef) = CW + ADG - DMI

EPDs ARE NOT ALL THE SAME!

BREED	BREED AVERAGES					TOP 10% OF BREED VALUES				
	CEW	BW	WW	YW	Milk	CEW	BW	WW	YW	Milk
ANGUS	+6	+1.3	+50	+88	+24	+12	-1.0	+66	+117	+31
BRAUNVIEH	+5.7	+2.7	+44	+70	+33	+9.2	-1.8	+56	+95	+41
HEREFORD	+1.2	+3.1	+50	+82	+22	+5.1	+0.4	+63	+103	+32
RED ANGUS	+5	-1.6	+59	+91	+21	+12	-5.2	+78	+122	+31
CHAROLAIS	+5.1	+3	+29	+53	+9	+10	-2.3	+43	+73	+18



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### Breeding

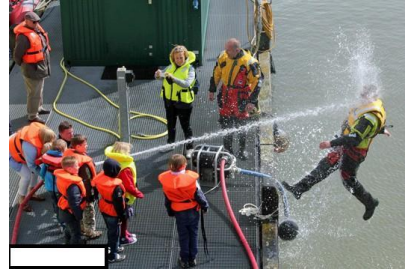
- ✓ Keep it Simple:
  - ✓ 2 breed cross offer most hybrid vigor and market appeal
  - ✓ No more than a 3 breed "mix"
  - ✓ Consistent use of sire breeds
- ✓ Develop a breeding rotation plan
- ✓ Ave Bull:Cows ratio = 1:20
- ✓ REMEMBER!!! You are only keeping about 15% of your heifers.



VS



### Step #3..... Finding the right bull(s)



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SCENARIO 1: Smaller herd that runs heifers and cows together. Generally keep 15% of the heifers as replacements.

??? WHAT TRAITS SHOULD BE CONSIDERED???

Siremen Code	Name	CE	BW	BW Acc	WW	YW	RADG	YH	SC	DOC	CEM	Milk	SEN	CW	Marb	RE	Fat	SW	EP	SG	SB
TAN291	Tanker	12	8	80	85	147	28	1.1	1.14	30	11	24	-27.82	42	89	29	271	81.13	131.70	28.83	144.39
TAN290	Empire	14	-1.7	72	83	180	28	3	80	26	12	27	-28.80	64	81	1.87	219	100.72	86.92	34.83	183.78
TAN415	Power Surge	7	7	79	80	197	23	8	1.29	28	9	30	-33.31	39	83	177	208	98.29	103.60	88.68	140.92
TAN249	High Up	6	1.4	83	78	144	40	7	90	17	10	22	-28.48	70	73	94	205	74.18	127.21	38.81	189.54
TAN434	Empire	13	-1.1	44	76	134	29	1.1	-06	23	11	40	-61.21	38	1.17	1.00	241	84.88	111.83	91.33	157.18
TAN410	Chieftan	1	1.1	48	76	127	19	7	24	26	6	39	-48.36	51	88	188	-206	95.20	82.82	38.89	152.43
TAN427	Manning	11	1.9	36	75	129	27	8	87	17	13	34	-41.22	58	79	1.31	208	83.70	96.29	80.26	176.04
TAN288	Bullus	19	-1.3	85	76	126	31	4	1.29	23	19	18	-3.87	17	61	32	242	80.98	103.70	33.64	166.06
TAN289	Lipton	12	-1.1	84	75	126	18	8	47	29	13	30	-32.45	81	78	89	251	88.69	70.69	33.17	183.81
TAN270	Signature	0	2.7	87	75	134	34	4	1.41	14	5	32	-32.78	49	54	1.93	217	84.28	119.91	38.65	171.80

SCENARIO 2: Larger herd that would like to AI for improved growth in their calves. Typically does not keep replacements from this group of cows.

??? WHAT TRAITS SHOULD BE CONSIDERED???

Siremen Code	Name	CE	BW	BW Acc	WW	YW	RADG	YH	SC	DOC	CEM	Milk	SEN	CW	Marb	RE	Fat	SW	EP	SG	SB
TAN291	Tanker	12	8	80	85	147	28	1.1	1.14	30	11	24	-27.82	42	89	29	271	81.13	131.70	28.83	144.39
TAN290	Fortress	14	-1.7	72	83	130	25	3	80	26	12	27	-28.80	64	81	1.07	239	100.72	86.92	34.83	183.78
TAN415	Power Surge	7	7	79	80	197	23	8	1.29	28	9	30	-33.31	39	83	177	208	98.29	103.60	88.68	140.92
TAN430	High Up	6	1.4	83	78	144	40	7	90	17	10	22	-28.48	70	73	94	205	74.18	127.21	38.81	189.54
TAN434	Empire	13	-1.1	44	76	134	29	1.1	-06	23	11	40	-61.21	38	1.17	1.00	241	84.88	111.83	91.33	157.18
TAN410	Chieftan	1	1.1	48	76	127	19	7	24	26	6	39	-48.36	51	88	188	-206	95.20	82.82	38.89	152.43
TAN427	Manning	11	1.9	36	75	129	27	8	87	17	13	34	-41.22	58	79	1.31	208	83.70	96.29	80.26	176.04
TAN288	Bullus	19	-1.3	85	76	126	31	4	1.29	23	19	18	-3.87	17	61	32	242	80.98	103.70	33.64	166.06
TAN289	Lipton	12	-1.1	84	75	126	18	8	47	29	13	30	-32.45	81	78	89	251	88.69	70.69	33.17	183.81
TAN270	Signature	0	2.7	87	75	134	34	4	1.41	14	5	32	-32.78	49	54	1.93	217	84.28	119.91	38.65	171.80



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### Who do I like???

Siremen Code	Name	CE	BW	BW Acc	WW	YW	RADG	YH	SC	DOC	CEM	Milk	SEN	CW	Marb	RE	Fat	SW	EP	SG	SB
TAN291	Tanker	12	8	80	85	147	28	1.1	1.14	30	11	24	-27.82	42	89	29	271	81.13	131.70	28.83	144.39
TAN290	Fortress	14	-1.7	72	83	130	25	3	80	26	12	27	-28.80	64	81	1.07	239	100.72	86.92	34.83	183.78
TAN415	Power Surge	7	7	79	80	197	23	8	1.29	28	9	30	-33.31	39	83	177	208	98.29	103.60	88.68	140.92
TAN249	High Up	6	1.4	83	78	144	40	7	90	17	10	22	-28.48	70	73	94	205	74.18	127.21	38.81	189.54
TAN434	Empire	13	-1.1	44	76	134	29	1.1	-06	23	11	40	-61.21	38	1.17	1.00	241	84.88	111.83	91.33	157.18
TAN410	Chieftan	1	1.1	48	76	127	19	7	24	26	6	39	-48.36	51	88	188	-206	95.20	82.82	38.89	152.43
TAN427	Manning	11	1.9	36	75	129	27	8	87	17	13	34	-41.22	58	79	1.31	208	83.70	96.29	80.26	176.04
TAN288	Bullus	19	-1.3	85	76	126	31	4	1.29	23	19	18	-3.87	17	61	32	242	80.98	103.70	33.64	166.06
TAN289	Lipton	12	-1.1	84	75	126	18	8	47	29	13	30	-32.45	81	78	89	251	88.69	70.69	33.17	183.81
TAN270	Signature	0	2.7	87	75	134	34	4	1.41	14	5	32	-32.78	49	54	1.93	217	84.28	119.91	38.65	171.80



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## Now its your turn...

You are at a bull sale wanting to find 3 bulls for your herd.

1. What is your goal?
  1. Maternal
  2. Growth
2. Look at the data
3. Look at the bull
4. What is your budget?
  1. Set a max price on your top picks, 2<sup>nd</sup> picks etc.



**Cholla Livestock LLC**  
Big Boquillas Ranch Seligman, Arizona



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Lot 1 - #221



CED	BW	WW	MILK	YW	REA	MARB
6	2.4	85	17	137	0.38	0.74



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Lot 2 - #197



CED	BW	WW	MILK	YW	REA	MARB
6	1	59	16	110	0.52	0.24



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Lot 3- #173



CED	BW	WW	MILK	YW	REA	MARB
0	2.3	78	38	144	0.78	0.82



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Lot 4- #219



CED	BW	WW	MILK	YW	REA	MARB
10	-0.8	66	22	119	0.4	0.79



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Lot 5 - #131



CED	BW	WW	MILK	YW	REA	MARB
3	2.7	82	27	144	0.73	0.59



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Lot 6 - #6882



CED	BW	WW	MILK	YW	REA	MARB
15	-1.7	81	25	123	0.10	0.56



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Lot 7 - #6891



CED	BW	WW	MILK	YW	REA	MARB
15	-2.9	80	25	130	0.3	0.76



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Lot 8 - #6893



CED	BW	WW	MILK	YW	REA	MARB
10	0.9	86	27	129	0.78	0.32



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Lot 9 - #6892



CED	BW	WW	MILK	YW	MARB	REA
17	-4.3	69	21	107	0.19	0.27



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Lot 10 - #6881



CED	BW	WW	MILK	YW	MARB	REA
11	0.2	90	26	153	0.45	0.72



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## In Summary....

- ✓ WHO ARE YOU BREEDING
- ✓ WHAT ARE YOUR GOALS?
- ✓ SELECT A FEW TRAITS THAT WILL BEST MEET
  - ✓ Avoid single trait selection
    - ✓ ie Focusing on Calving Ease = ↓ Performance ↑ Calving Difficulty???
- ✓ DO YOUR HOMEWORK
  - ✓ How does the bulls EPD's rank within breed
  - ✓ What accuracies is he carrying for a specific trait
- ✓ AVOID USING ONLY ONE BULL or SAME BULL EACH YEAR



Thank You!



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