

# Basics of Sire Selection

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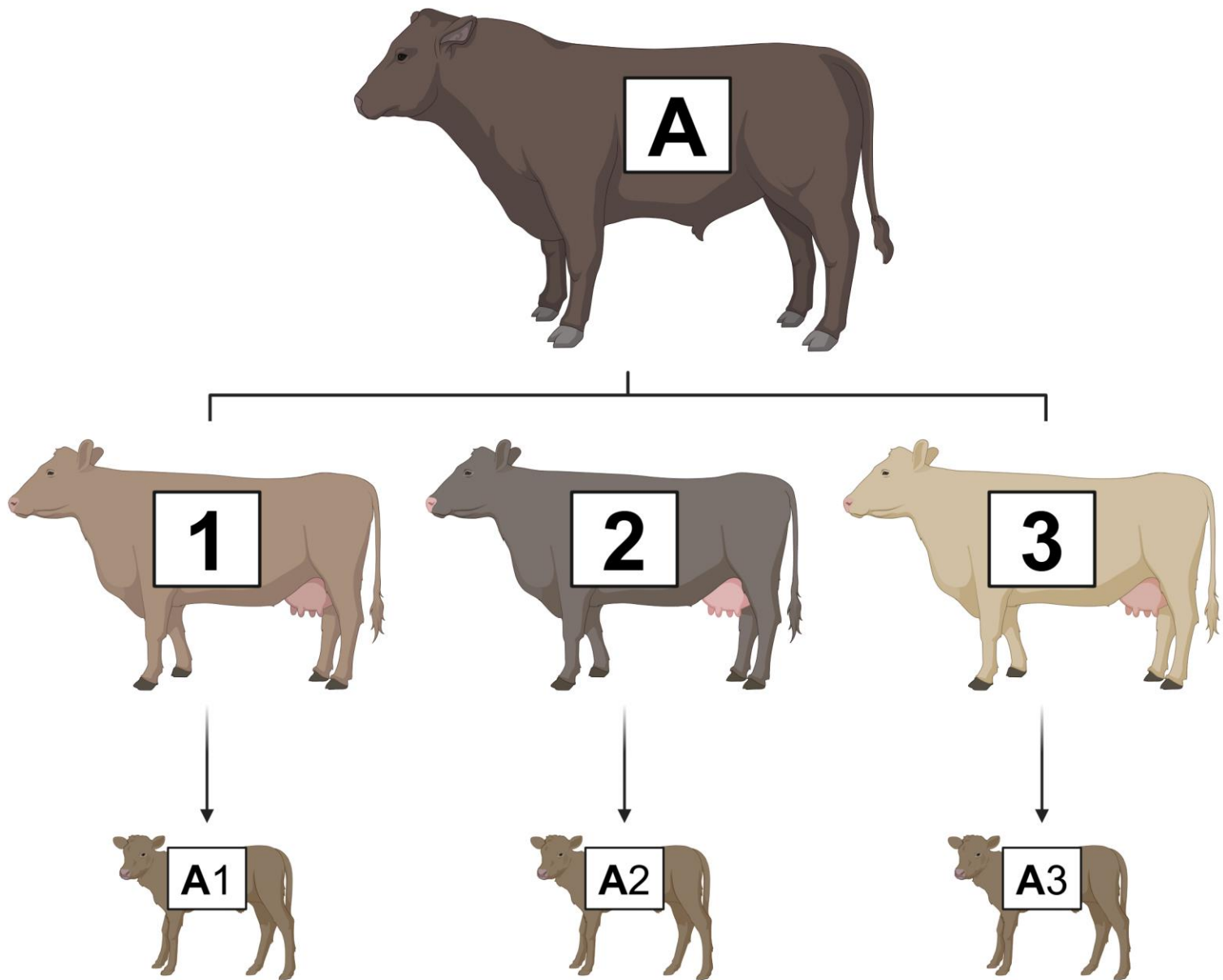
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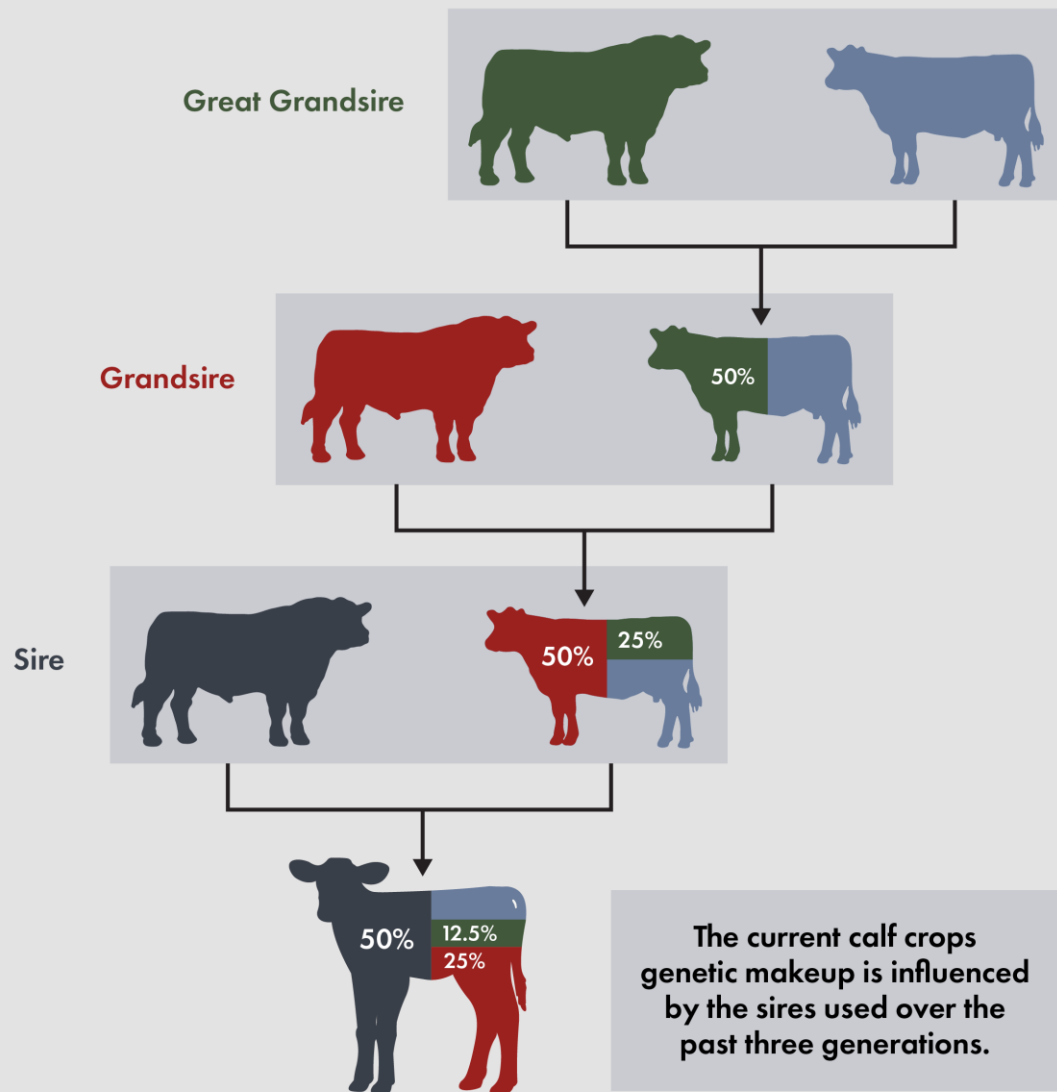
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## Genetic Impact of Sire Selection



[BEEFRESEARCH.CA/GENETIC-RECORD-KEEPING](http://BEEFRESEARCH.CA/GENETIC-RECORD-KEEPING)

If retaining  
heifers, 87.5% of her  
genetics come from  
**last three sires**  
used in the herd.

The sire you use in  
your breeding  
program in **2025** will  
genetically influence  
calves in **2028**  
...choose wisely!

Beef Cattle Research Council

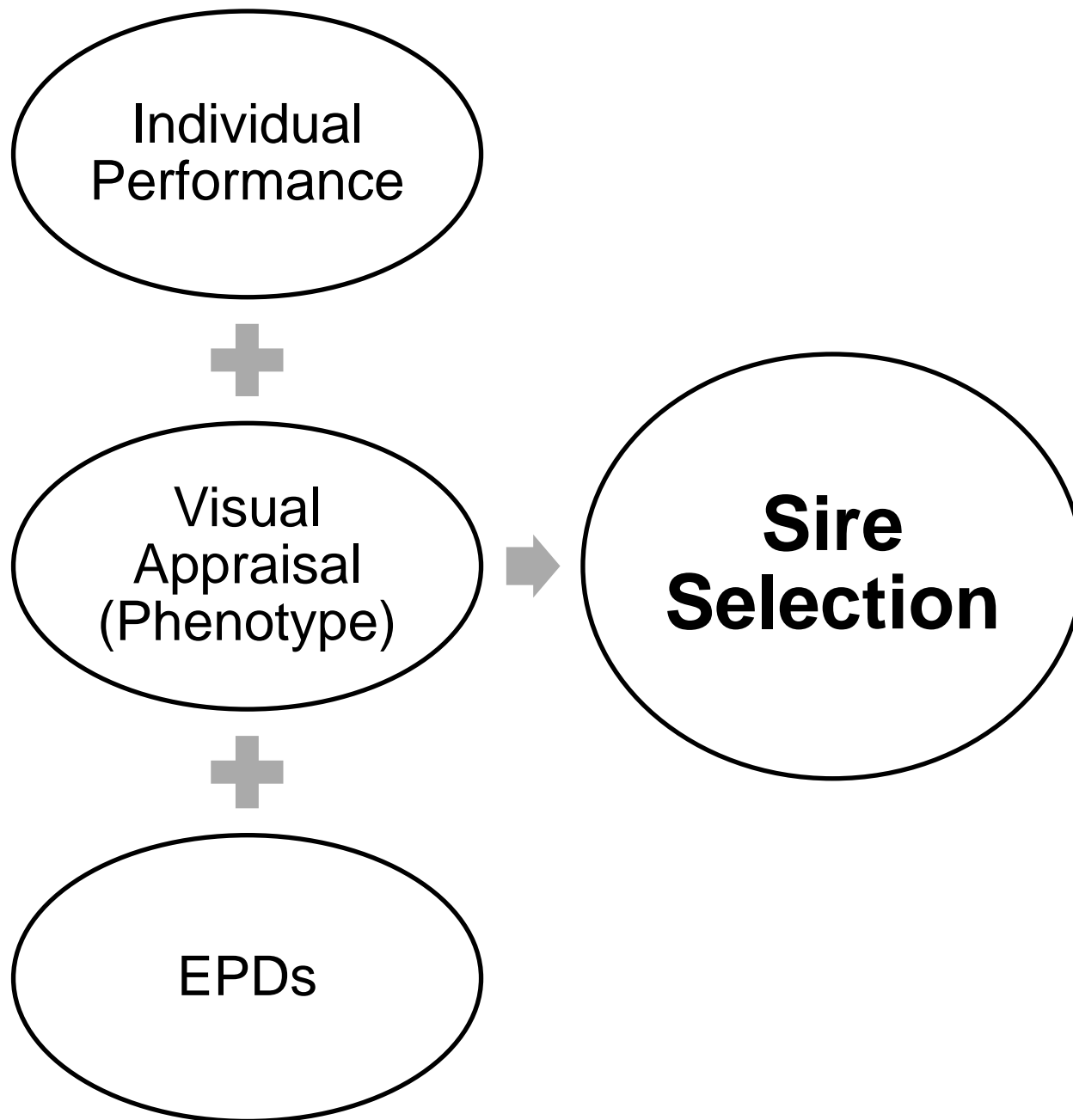
# How do I know what's best?



# Steps to Sire Selection

1. Set direction for your operation
  - Production goal
  - Selection priorities
2. Evaluate seedstock producers
  - Environment / management
  - Production goals
3. Evaluate sires → start with reference sires
  - Contact seller
  - Soundness
4. Budget

Use all the  
information available  
to you to make  
**informed decisions.**



# Understanding EPDs

## *Expected Progeny Difference*

- A prediction (+ OR -)
- Estimate of sire's ability to transmit genetic potential to offspring
- How is the value calculated?
  - Sire's performance data
  - Performance data of sire's progeny, dam, sire, siblings, etc.
  - Genetic correlations
- Accuracy
  - $0 \rightarrow 1$
  - Level of confidence in EPD
  - Not related to variation in progeny
  - More data = more accuracy
  - Yearling bulls may have low accuracy

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  - Genetic correlations
- Accuracy
  - 0 → 1
  - Level of confidence in prediction
- EPD is a prediction of variation in progeny performance = more variation = more variation
- Yearling bulls may have low accuracy

**Only compare EPDs (and Index values) between sires of the same breed**



# Abbreviations to Know

EPD	Definition	Breed	Units / Explanation
CED CE	Calving Ease Direct Calving Ease	-	<i>Percent</i> of unassisted calving in <b>mated</b> 2-year-olds
MCE CEM	Maternal Calving Ease Calving Ease Maternal	-	<i>Percent</i> of unassisted calving in <b>sire's daughters</b>
BW, WW, YW, CW	Birth, Weaning, Yearling, Carcass Weight	-	<i>Pounds</i>
SC	Scrotal Circumference	-	<i>Centimeters</i>
MM Milk	Maternal Milk	-	<i>Pounds</i> of weaning weight due to milking ability of sire's daughters
UDDR / TEAT US / TS	Udder suspension / Teat size	Hereford	<i>Scale points</i> (1 to 9) of sire's daughters
SCF STAY	Sustained Cow Fertility Stayability	Hereford Simmental	<i>Probability</i> of sire's daughters remain in herd at 6 (Sim.) or 12 (Hereford) years
HP	Heifer Pregnancy	Angus	<i>Percent</i> , probability of sire's daughters becoming pregnant as first-calf heifers
PAP	Pulmonary Arterial Pressure	Angus	<i>mmHg</i> , lower is better, susceptibility of sire's progeny to altitude disease
RE / REA	Ribeye Area	-	<i>Square inches</i> , ribeye area of progeny

# Understanding \$Index

## Typically designed for specific scenario

- Formed from set of traits that have economic relevance
- May not know **all traits** included in the index value / relevance to **YOU**
- Each trait is weighted in the index equation
- Don't know **how much** each trait is weighted
- Considers inputs AND outputs

# Abbreviations to Know

Index	Definition	Breed	Explanation
BMI\$	Baldy Maternal Index	Hereford	$\$/hd$ ; Maternal + SCF, WW, MCW, MM, CW, MARB, REA; - DMI
CHB\$	Certified Hereford Beef Index	Hereford	$\$/hd$ ; Terminal → progeny targeted to CHB + CW, MARB, ADG, REA; - DMI, FAT
\$M	Maternal Weaned Calf Value	Angus	$\$/hd$ ; conception to weaning profit, retain heifers; CED, CEM, WW, Milk, HP, DOC, MCW, Claw, Angle
\$W	Weaned Calf Value	Angus	$\$/hd$ ; profit differences in progeny to weaning; BW, WW, Milk, MCW
\$G	Grid Value	Angus	$\$/carc.$ ; market cattle on above-industry-average carcass grid; CW, MARB, REA, FAT
\$B	Beef Value	Angus	$\$/carc.$ ; terminal; YW, DMI, MARB, CW, REA, FAT
\$C	Combined Value	Angus	$\$/hd$ ; \$M + \$B; commercial, retain heifers, retain ownership through finishing, market on grid
API	All Purpose Index	Simmental	$\$/hd$ ; Use in entire herd, retain heifers, grid marketing
TI	Terminal Index	Simmental	$\$/hd$ ; Use in mature cows, all progeny grade & yield

# How Do We Use Them?

- Production goal:
  - Commercial AngusX cows, typically use Hereford sires
  - Sell weaned calves
  - Retain replacement heifers and AI, opens and late-breds sold
  - Grazing range environment
  - 1200 pound mature cow size
- Priorities?
  - **Maternal** focus → SC, SCF, MCW, MCE, US, TS
  - Get paid on **live calves** and **weaned pounds** → CE, WW
  - Potential for **limited inputs** → Milk, DMI, MCW
  - BMI\$?

\$/hd; Maternal  
+ SCF, WW, MCW, Milk, CW, MARB, REA; - DMI

# How Do We Use Them?

- Priorities?

- Maternal focus → SC, SCF, MCW, MCE, US, TS
- Get paid on live calves and weaned pounds → CED, WW
- Potential for limited inputs → Milk, DMI, MCW
- BMI\$?

\$/hd; Maternal

+ SCF, WW, MCW, Milk, CW, MARB, REA; - DMI

Sire	CED	BW	WW	YW	DMI	SC	SCF	MILK	M&G	MCE	MCW	US	TS	CW	FAT	REA	MARB	BMI	BII	CHB
A	9.7	-0.7	75	95	0.2	1.2	22.5	40	78	5.0	64	1.6	1.6	87	0.042	0.22	0.88	572	622	187
B	1.0	5.6	85	112	0.2	1.1	27.3	30	63	1.9	95	1.5	1.5	90	0.063	0.81	0.24	560	642	164
C	16	-1.6	67	84	0.5	1.6	20.4	29	63	13	101	1.5	1.6	72	0.033	0.76	0.31	480	510	142
D	9.5	0.7	65	98	0.6	1.6	22.7	34	67	11	89	1.5	1.5	85	0.056	0.92	0.56	420	608	168

Avg	3.4	2.6	56	89	0.2	1.0	17.0	27	55	1.6	88	1.2	1.3	71	0.023	0.45	0.14	364	439	121
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# Percentile Rankings

## Where a bull ranks within the breed

American Hereford Association  
EPDs as of December 2, 2024  
Pan American Hereford Cattle Evaluation

Average and Percentile Breakdown - Active Sires

	Production				Fertility				Maternal				Carcass				\$ Indexes			
	CED	BW	WW	YW	DMI	SC	SCF	MM	M&G	CEM	MCW	UDDR	TEAT	CW	FAT	REA	MARB	BMI	BII	CHB
Average	3.6	2.6	56	89	0.2	1.0	17.0	27	55	1.6	88	1.2	1.3	71	0.023	0.45	0.14	364	439	121
Low	-13.8	-9	-12	-33	-1.2	-0.7	-4.3	-8	-9	-15.3	-23	0.2	0.4	2	-0.107	-0.59	-0.53	66	116	14
High	23.7	11.2	91	153	2.5	3.0	35.6	64	90	16.8	174	2.0	2.0	131	0.163	1.46	1.36	653	778	251
Percentile Breakdown																				
Upper 1%	16.4	-4.7	80	130	-0.8	2.2	29.2	45	78	10.7	20	1.6	1.7	106	-0.057	1.10	0.69	566	668	196
2%	14.8	-3.2	77	125	-0.7	2.1	27.8	43	75	9.6	33	1.6	1.6	101	-0.047	1.01	0.60	542	644	184
3%	13.9	-2.1	75	122	-0.5	2.0	27.0	41	74	9.0	38	1.6	1.6	98	-0.037	0.96	0.54	526	625	178
4%	13.0	-1.5	74	119	-0.5	1.9	26.3	40	72	8.4	43	1.5	1.6	96	-0.037	0.91	0.49	517	611	173
5%	12.3	-1.1	73	117	-0.4	1.8	25.7	39	71	7.9	46	1.5	1.5	94	-0.027	0.89	0.45	506	602	170
10%	10.0	-0.1	69	111	-0.2	1.7	23.8	37	68	6.5	57	1.4	1.5	88	-0.017	0.78	0.36	475	564	155
15%	8.7	0.6	67	107	-0.1	1.5	22.5	35	66	5.6	64	1.4	1.4	85	-0.007	0.71	0.30	452	538	147
20%	7.7	1.0	65	104	-0.1	1.4	21.5	33	64	4.9	69	1.4	1.4	82	-0.007	0.65	0.26	434	517	141
25%	6.8	1.4	63	101	0.0	1.4	20.5	32	63	4.3	73	1.3	1.4	80	0.003	0.61	0.23	419	500	136
30%	6.1	1.7	62	99	0.0	1.3	19.8	31	61	3.7	77	1.3	1.3	78	0.003	0.58	0.21	406	485	132
35%	5.4	1.9	61	97	0.1	1.2	19.0	30	60	3.1	80	1.3	1.3	76	0.013	0.54	0.18	394	471	128
40%	4.7	2.2	59	95	0.1	1.2	18.3	29	59	2.6	83	1.3	1.3	75	0.013	0.51	0.16	383	459	124
45%	4.1	2.4	58	93	0.2	1.1	17.6	28	57	2.1	86	1.3	1.3	73	0.023	0.48	0.14	372	445	121
50%	3.5	2.7	57	91	0.2	1.0	17.0	27	56	1.6	89	1.2	1.3	71	0.023	0.45	0.12	362	434	118
55%	2.9	2.9	55	89	0.3	1.0	16.3	26	55	1.1	92	1.2	1.2	70	0.023	0.42	0.10	351	422	115
60%	2.3	3.1	54	87	0.3	0.9	15.6	25	53	0.6	95	1.2	1.2	68	0.033	0.39	0.08	341	411	112
65%	1.7	3.4	53	84	0.4	0.9	14.8	24	52	0.1	98	1.2	1.2	66	0.033	0.36	0.06	330	399	109
70%	1.0	3.6	51	82	0.4	0.8	14.1	23	50	-0.4	101	1.2	1.2	65	0.043	0.32	0.04	319	386	106
75%	0.2	3.9	50	80	0.5	0.7	13.3	22	49	-1.0	105	1.1	1.1	63	0.043	0.28	0.02	308	374	103
80%	-0.6	4.3	48	77	0.5	0.7	12.5	21	47	-1.7	109	1.1	1.1	61	0.053	0.24	-0.01	295	361	100
85%	-1.6	4.6	46	73	0.6	0.6	11.5	19	44	-2.5	113	1.1	1.1	58	0.053	0.19	-0.03	280	344	96
90%	-2.9	5.2	43	69	0.7	0.4	10.2	17	41	-3.5	119	1.0	1.0	54	0.063	0.13	-0.07	258	323	90
95%	-4.7	6.0	38	60	0.8	0.3	8.3	12	34	-4.8	127	1.0	1.0	48	0.083	0.02	-0.12	232	292	81
100%	-13.8	11.2	-12	-33	2.5	-0.7	-4.3	-8	-9	-15.3	174	0.2	0.4	2	0.163	-0.59	-0.53	66	116	14

8,282 sires produced at least 10 calves since January 1, 2022

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High	23.7	11.2	91	153	2.5	3.0	35.6	64	90	16.8	174	2.0	2.0	131	0.163	1.46	1.36	653	778	251
Percentile Breakdown																				
Upper 1%	16.4	-4.7	80	130	-0.8	2.2	29.2	45	78	10.7	20	1.6	1.7	106	-0.057	1.10	0.69	566	668	196
2%	14.8	-3.2	77	125	-0.7	2.1	27.8	43	75	9.6	33	1.6	1.6	101	-0.047	1.01	0.60	542	644	184
3%	13.9	-2.1	75	122	-0.5	2.0	27.0	41	74	9.0	38	1.6	1.6	98	-0.037	0.96	0.54	526	625	178
4%	13.0	-1.5	74	119	-0.5	1.9	26.3	40	72	8.4	43	1.5	1.6	96	-0.037	0.91	0.49	517	611	173
5%	12.3	-1.1	73	117	-0.4	1.8	25.7	39	71	7.9	46	1.5	1.5	94	-0.027	0.89	0.45	506	602	170
10%	10.0	-0.1	69	111	-0.2	1.7	23.8	37	68	6.5	57	1.4	1.5	88	-0.017	0.78	0.36	475	564	155
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20%	7.7	1.0	65	104	-0.1	1.4	21.5	33	64	4.9	69	1.4	1.4	82	-0.007	0.65	0.26	434	517	141
25%	6.8	1.4	63	101	0.0	1.4	20.5	32	63	4.3	73	1.3	1.4	80	0.003	0.61	0.23	419	500	136
30%	6.1	1.7	62	99	0.0	1.3	19.8	31	61	3.7	77	1.3	1.3	78	0.003	0.58	0.21	406	485	132
35%	5.4	1.9	61	97	0.1	1.2	19.0	30	60	3.1	80	1.3	1.3	76	0.013	0.54	0.18	394	471	128
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50%	3.5	2.7	57	91	0.2	1.0	17.0	27	56	1.6	89	1.2	1.3	71	0.023	0.45	0.12	362	434	118
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60%	2.3	3.1	54	87	0.3	0.9	15.6	25	53	0.6	95	1.2	1.2	68	0.033	0.39	0.08	341	411	112
65%	1.7	3.4	53	84	0.4	0.9	14.8	24	52	0.1	98	1.2	1.2	66	0.033	0.36	0.06	330	399	109
70%	1.0	3.6	51	82	0.4	0.8	14.1	23	50	-0.4	101	1.2	1.2	65	0.043	0.32	0.04	319	386	106
75%	0.2	3.9	50	80	0.5	0.7	13.3	22	49	-1.0	105	1.1	1.1	63	0.043	0.28	0.02	308	374	103
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8,282 sires produced at least 10 calves since January 1, 2022



# Remember...



**“Best” is relative**



# What Makes a Good Heifer?

*One that becomes a good cow!*

- Reproduction is 5X more valuable than calf growth
  - Live calves and longevity

Trenkle and Wilham, 1977

*Cow Depreciation:*

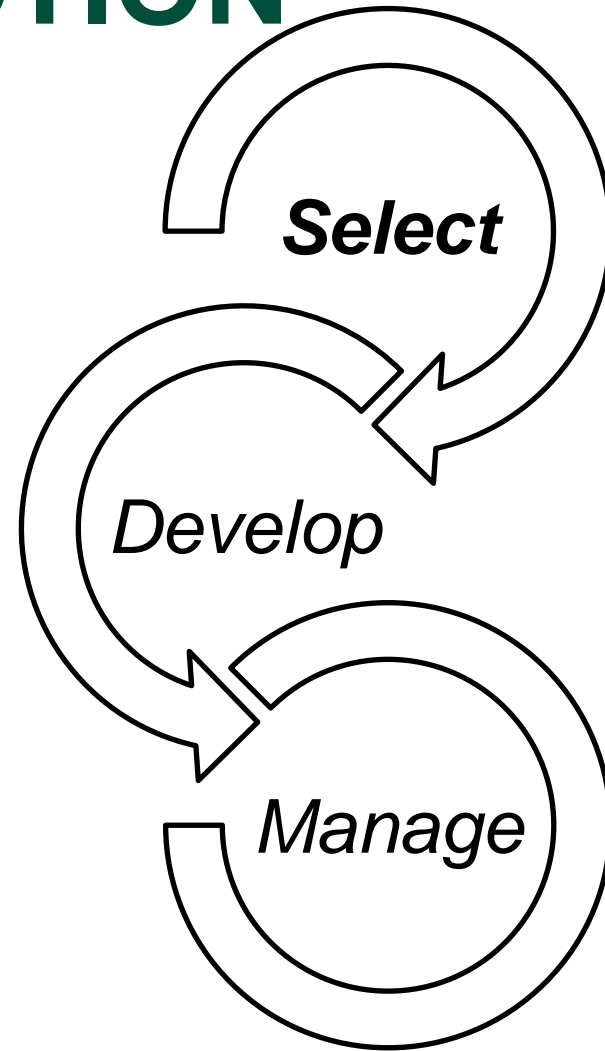
$$= \frac{\text{Replacement} - \text{Salvage}}{\# \text{ of productive years}}$$



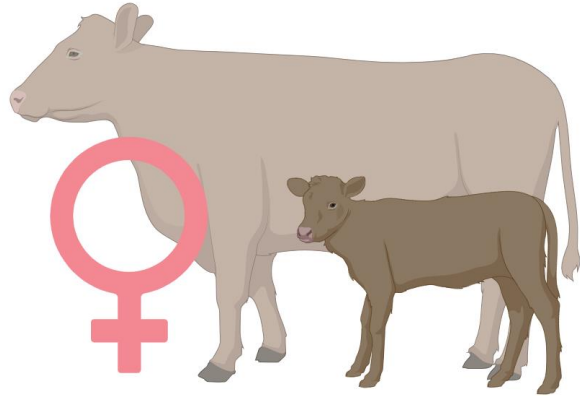
**We want to prepare heifers to have calves and stay in the herd for several years**

Photo by Lacey Quail

# SELECTION



# History Repeats Itself

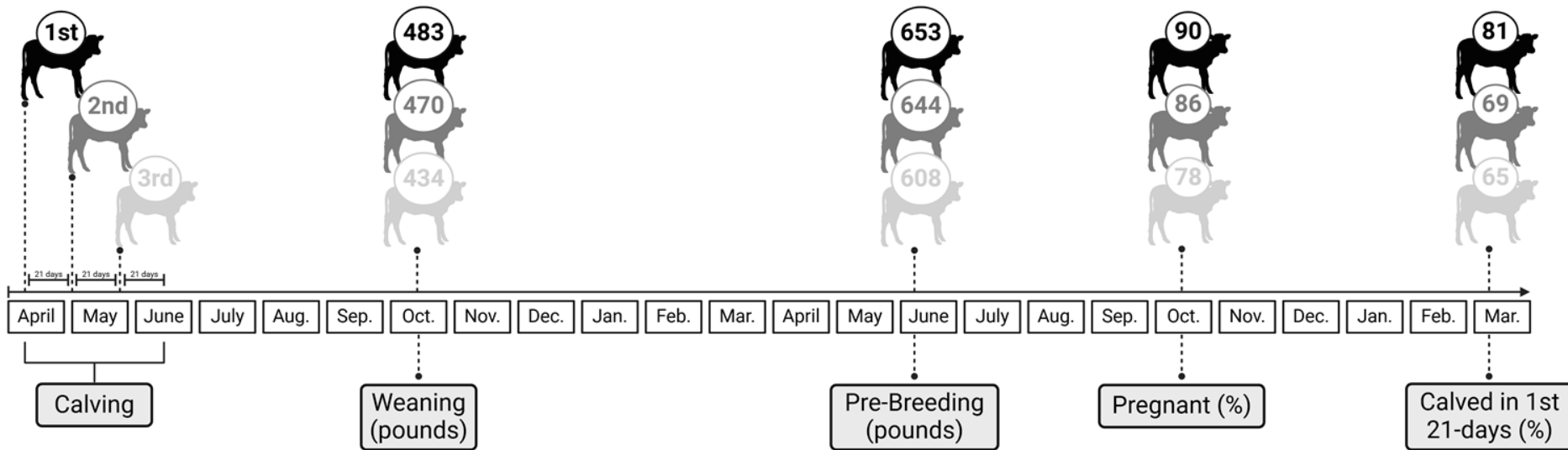


- Consider the cow
  - Dystocia
  - Calved late in the season
  - Failed to wean a calf
  - Teat/udder problems
  - Consistently weaned light calves
  - Attitude problems

## **Non-negotiables:**

- Born in first 21 days of the calving season
- Born from cows 4+ years of age
- Born from cows that fit your desired phenotype

# Early Born...Early Calving...



Heifers born in first 21-days are **heavier** at weaning and before breeding.

Heifers born in first 21-days have **greater pregnancy rates** and **calve earlier**.

# Early Born...Early Calving...Stay Longer

*More early born heifers  
calve early their first season*

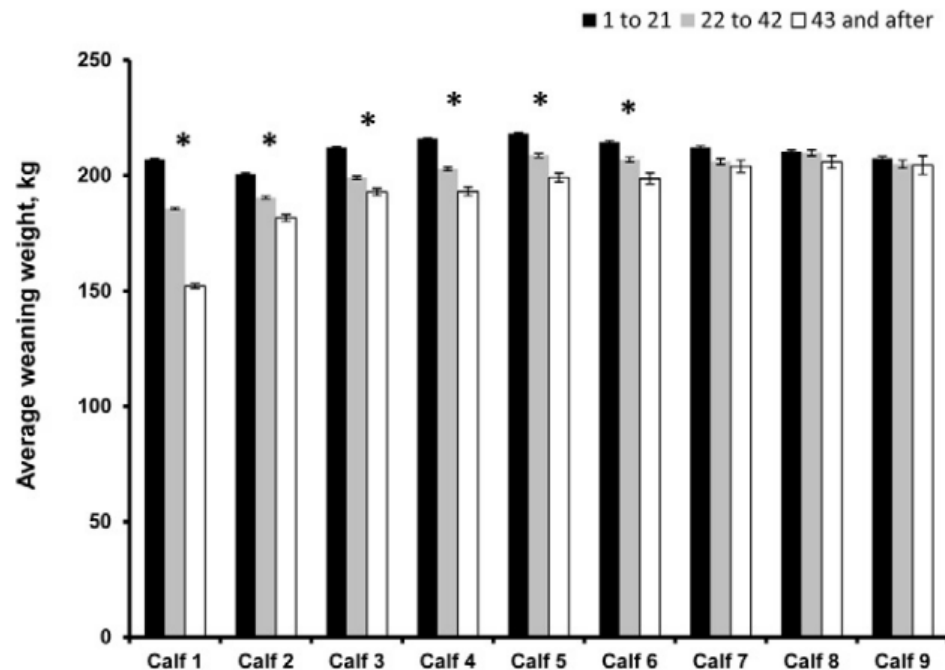
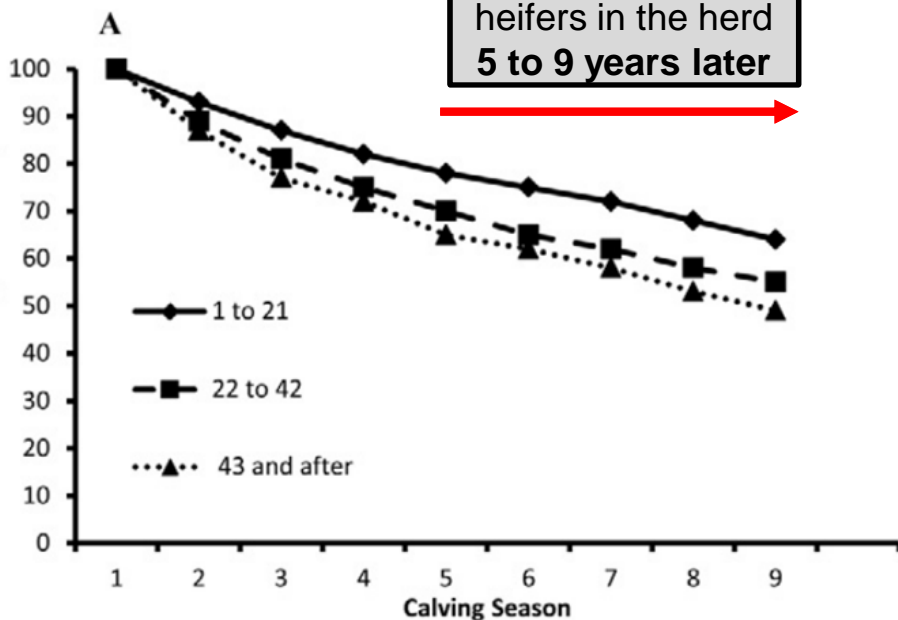


Made in biorender.com  
Adapted from Funston et al., 2012

Early-calving heifers  
wean heavier calves for  
six years



More early-calving  
heifers in the herd  
5 to 9 years later

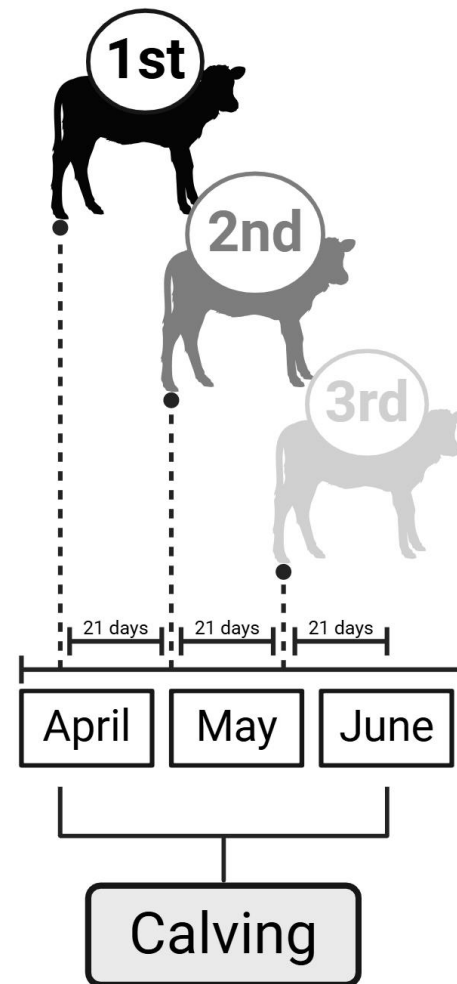


Cushman et al., 2013

# Early Born...Early Calving...Stay Longer

- Heifer calves **born or calving in first 21-days** of the calving season
  - Heavier
  - More likely to cycle prior to breeding
  - **Greater pregnancy rates**
  - **More likely to calve in the first 21-days of their first calving season**
  - **Stay in the herd longer**
  - Wean heavier calves for six years

*More live calves and greater longevity*  
**MORE PROFITABLE**





# Questions?



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