



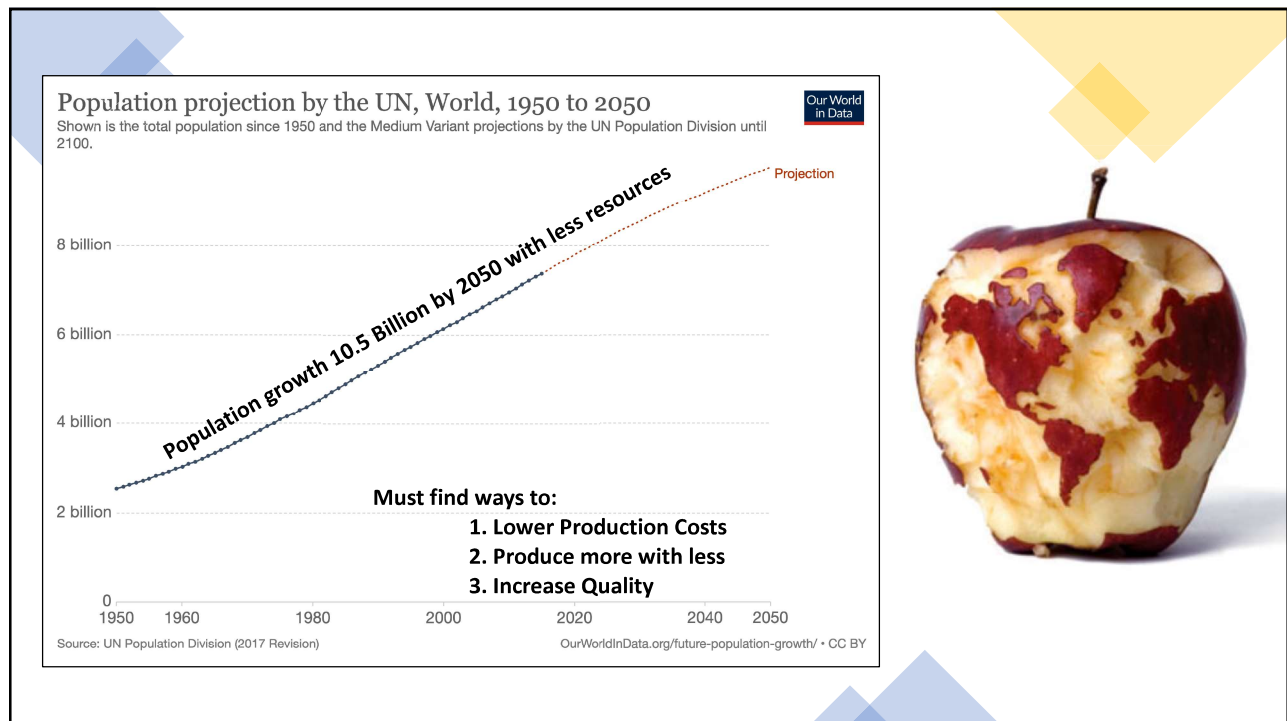
COLLEGE OF TROPICAL AGRICULTURE
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UNIVERSITY OF HAWAII AT MĀNOA

Matching Genetics to Environment: Optimizing Milk Production Levels in Beef Herds

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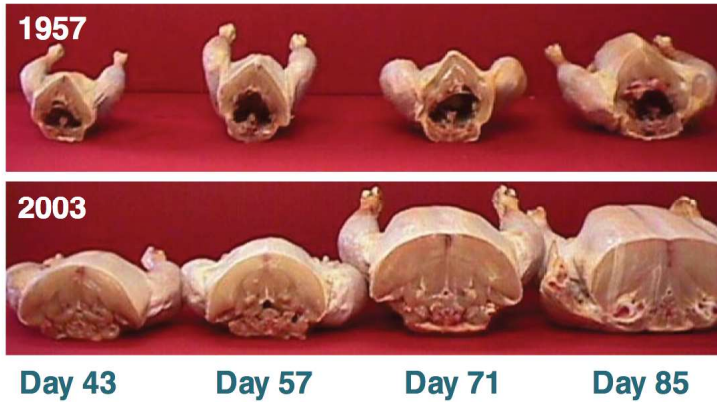
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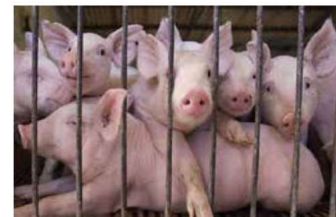
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Poultry, Milk and Pork Production have made great improvements in terms of production levels over time; typically raised in very intensive, highly regulated environments

Increasing yields over time

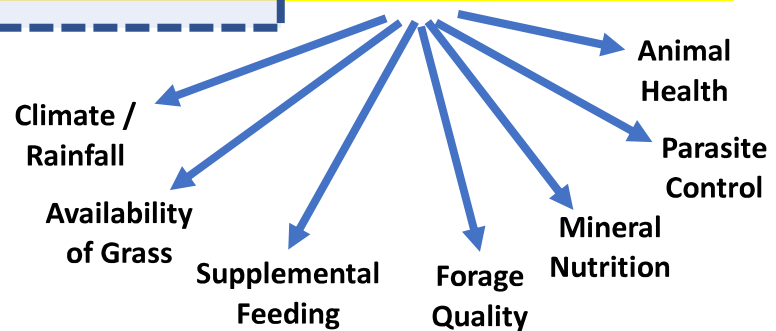
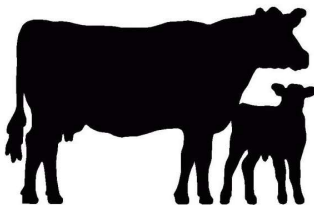


Phenotype = Genetics + Environment



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Phenotype = **Genetics** + Environment



Beef cattle are typical raised in extensive environments; mother nature can limit yields or the expression of genetic potential for a trait of interest

- You can either change Genetics to match your Environment.
- You can either change Environment and Management to match your Genetics (more inputs, more \$\$\$)

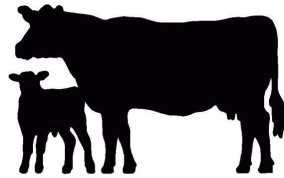
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Economically Relevant Traits for Beef Herds

Milk and Growth

Weaning Weights

“Pounds on the ground”



A plethora of selection tools

Fertility

“Cows that breed back”

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How do we measure milk production in beef cows?

indirectly

- Calf performance from birth to weaning age
- The amount of BCS she loses in contrast to her calf's own growth



We don't do this!

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Let's look at
a few more
examples

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Large Framed Cow
"eats more"

High Milk Cow
"eats more"

High Perf. Calves
"eats more"

Doesn't Breed Back!

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Mid-size 1st Calf Heifer
"eats average"

Still Growing

Above Average Milk
"eats more"

Above Average Calf
"eats more"

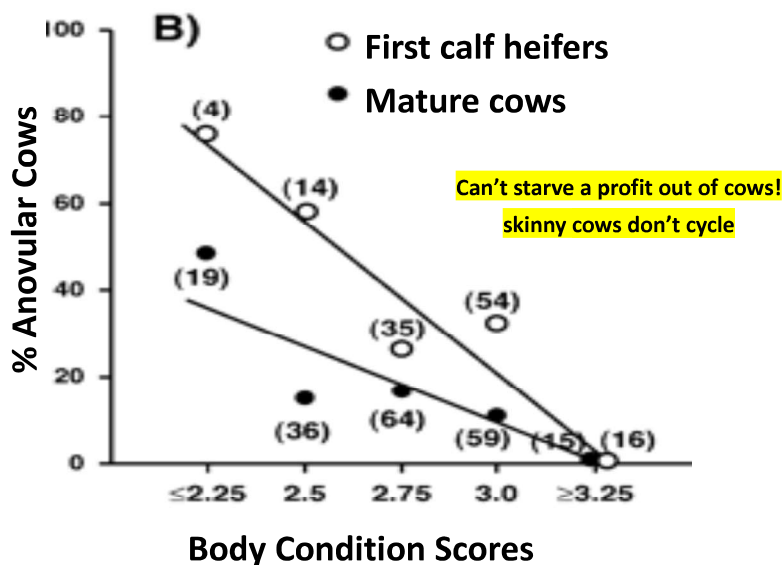
Bred Back!

A great start for this 1st calf heifer

She needs to repeat this record another 7 or 8 times for many of us to maximize profitability

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Goal: Maintain a 365-day calving interval



BCS of beef cows at the time of calving has the greatest impact on subsequent rebreeding performance







Relationship between nutritional status (measured by BCS) and reproductive cyclicity is strong


Nutrition and ovulation in multiparous and primiparous cows is linked (47 to 53 days post calving)

Gümen et al., J. Dairy Sci. 86:3184-3194

Manage/Feed them in order to breed them

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Body Condition Score of 3	Body Condition Score of 4	Body Condition Score of 5
		
		




BCS of beef cows at the time of calving has the greatest impact on subsequent rebreeding performance
Target a BCS of 4.5 to 5 for rebreeding

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Avoid Extremes



Cow that keeps her weight/BCS on pasture, but has low milk production, and produces poor calf performance



Cow with high milk, great calf performance, but she struggles to gain weight/BCS and rebreed on pasture without extra inputs.

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What do these cows all have in common?



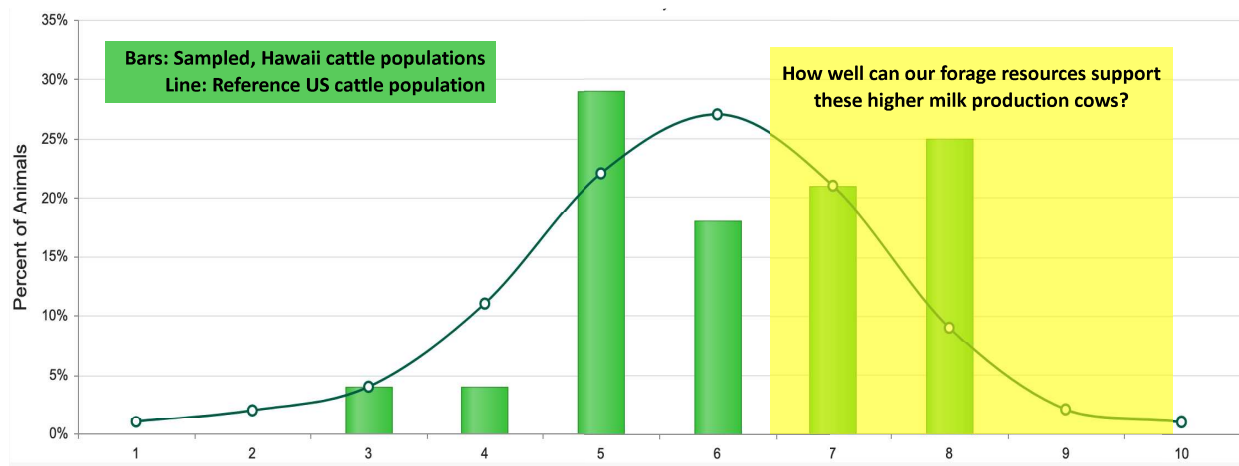
All these cows have produced calves of average or better quality, while maintaining a 365-day calving interval, past 10 years of age in a variety of different environments.

**Balanced &
problem-free =
Longevity**

Match genetic potential to your environment & management!

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Recent Genomic Benchmark Data of Milk Production Levels in Hawai'i's Beef Cattle Herds



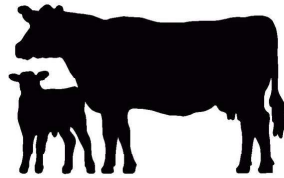
Caires et. al, 2020, unpublished

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How did we get here?

Weaning
Weights

“Pounds on
the ground”



Fertility

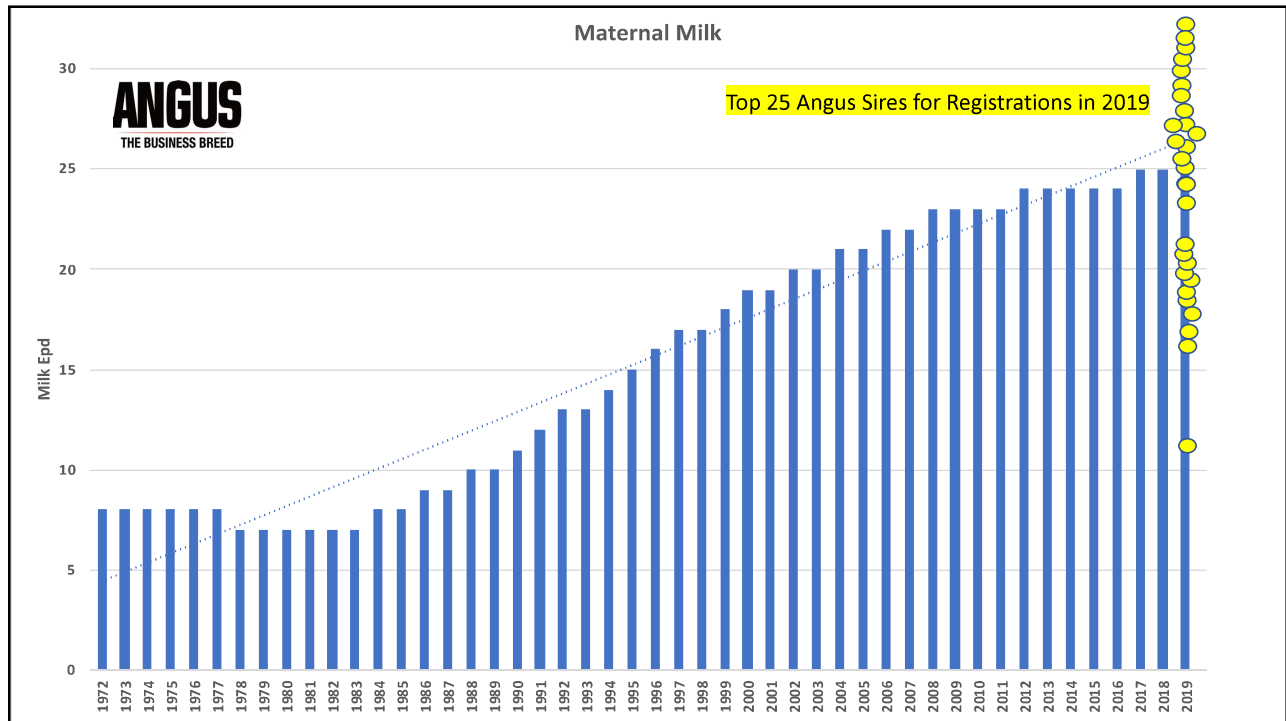
“Cows that
breed back”

*A plethora of selection tools and
their use in purebred herds*

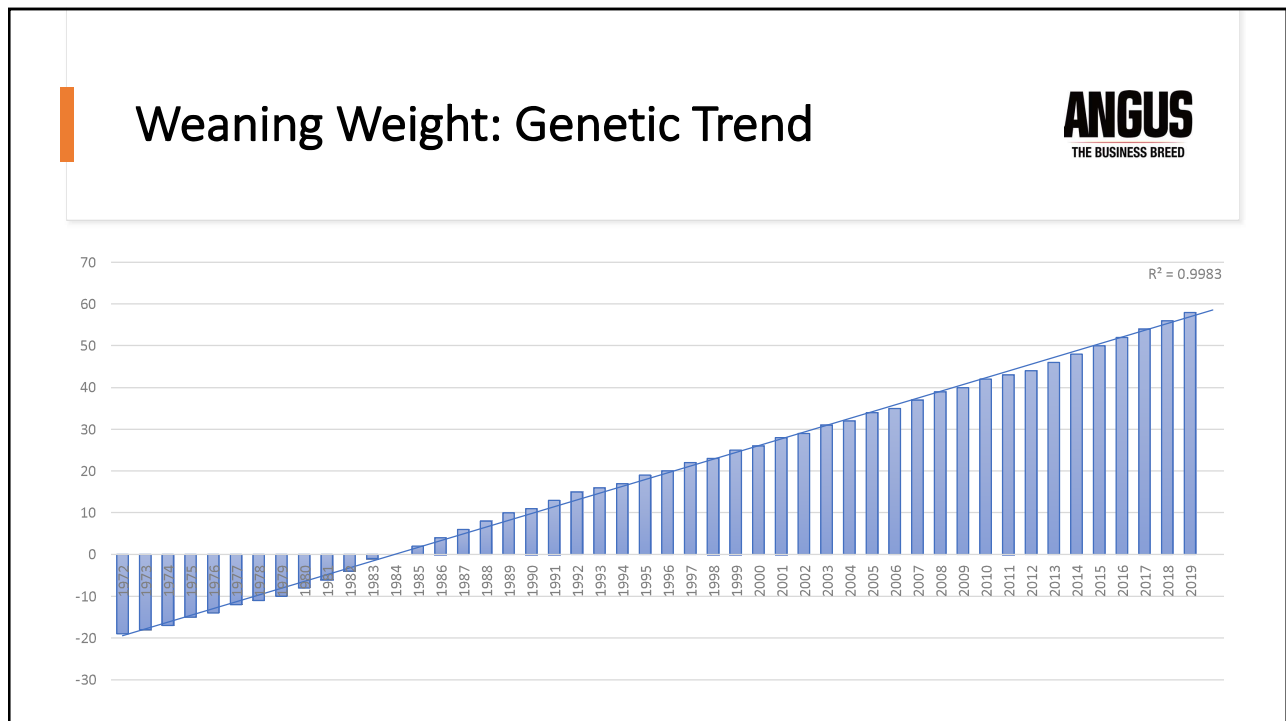
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**Let's take a look at what has
happened in purebred herds
over the past few decades**

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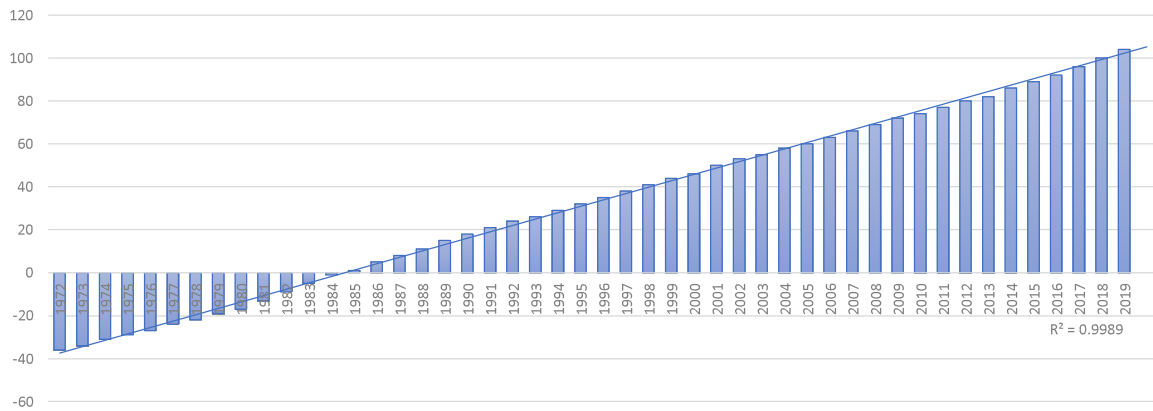
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Yearling Weight - Genetic Trend

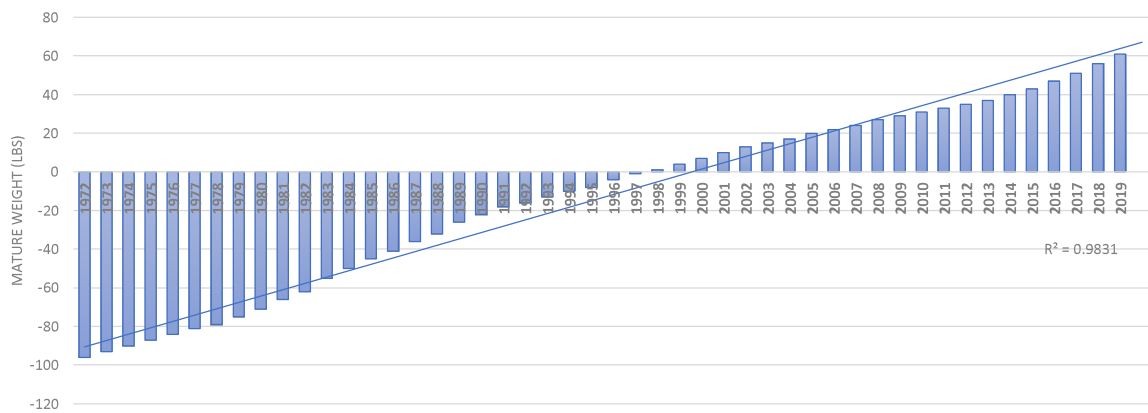
ANGUS
THE BUSINESS BREED



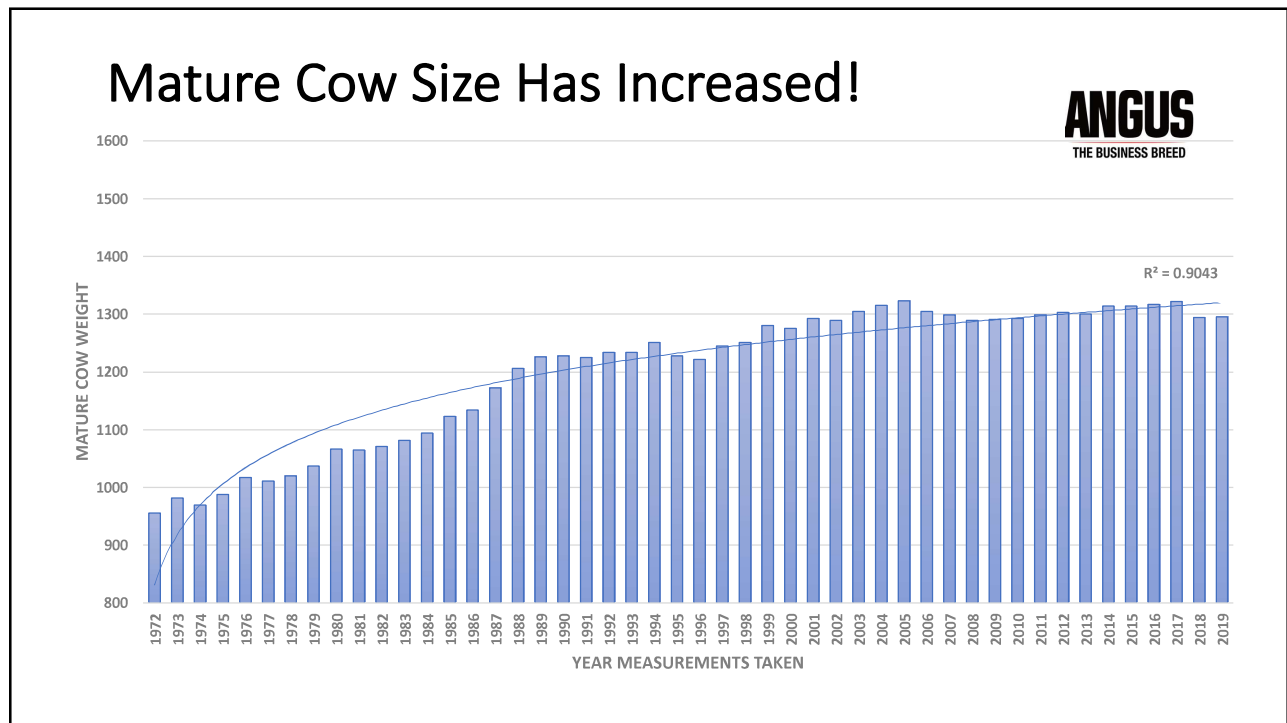
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Mature Weight - Genetic Trend

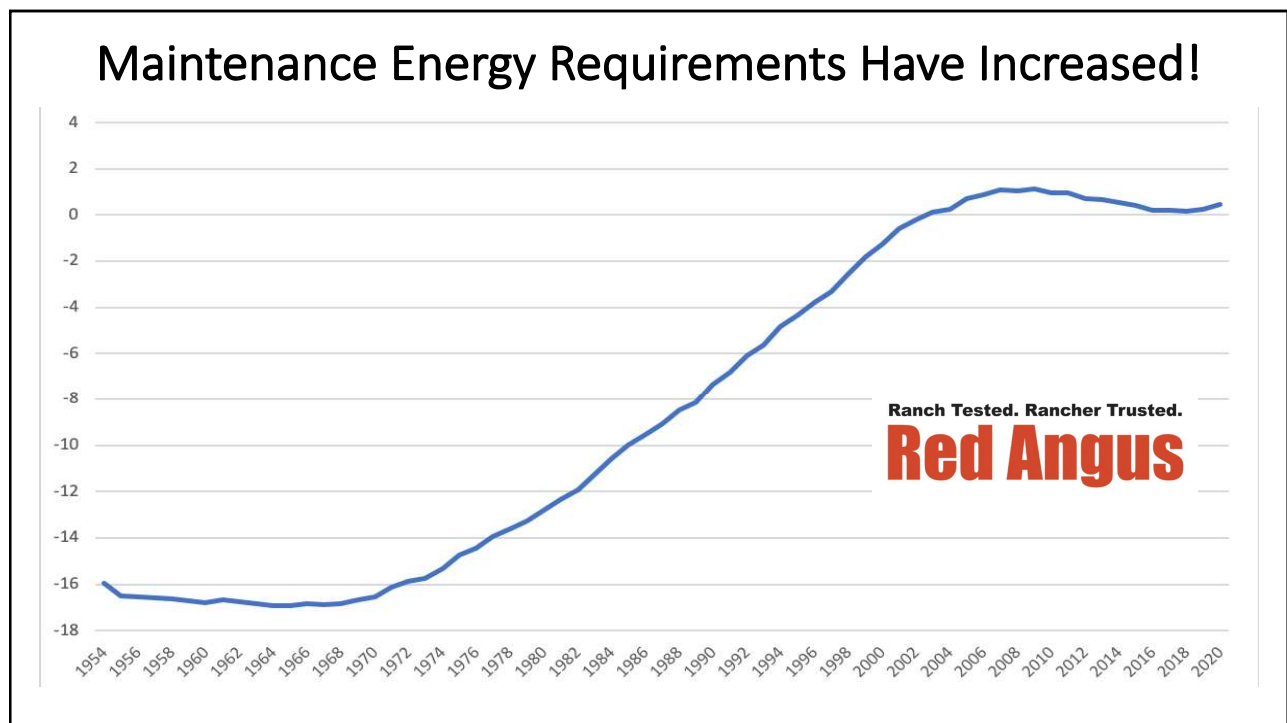
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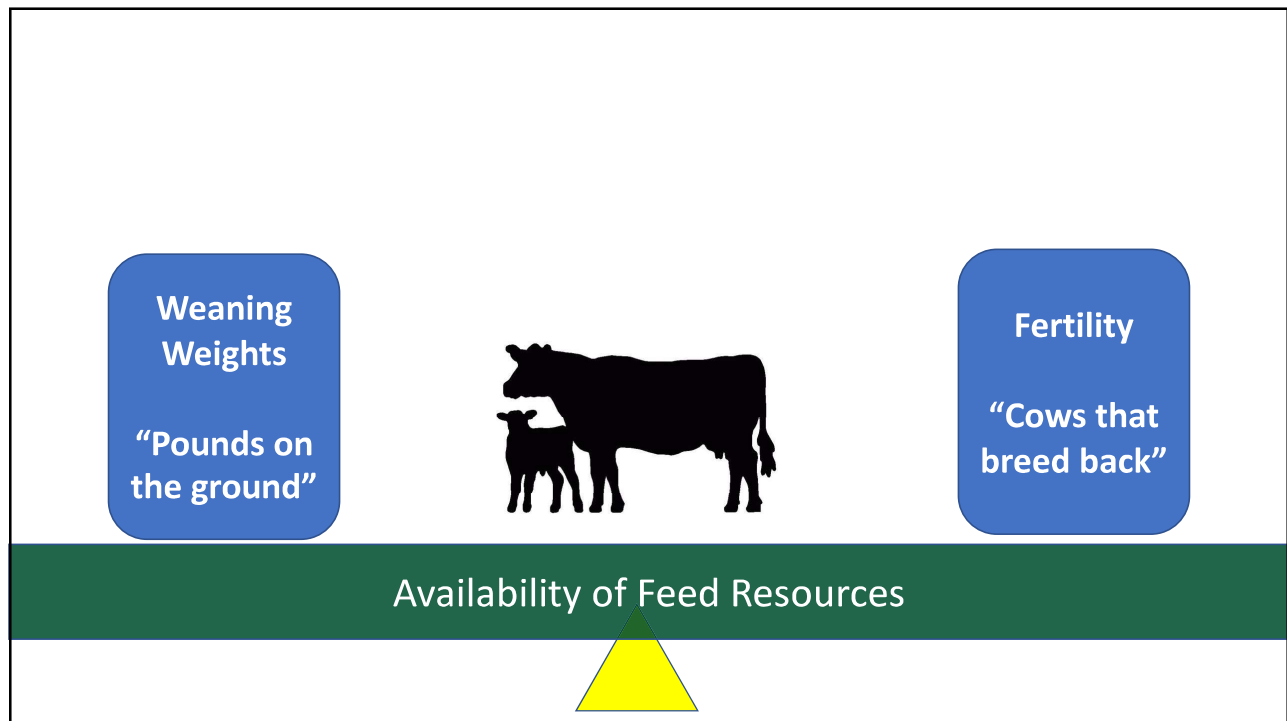
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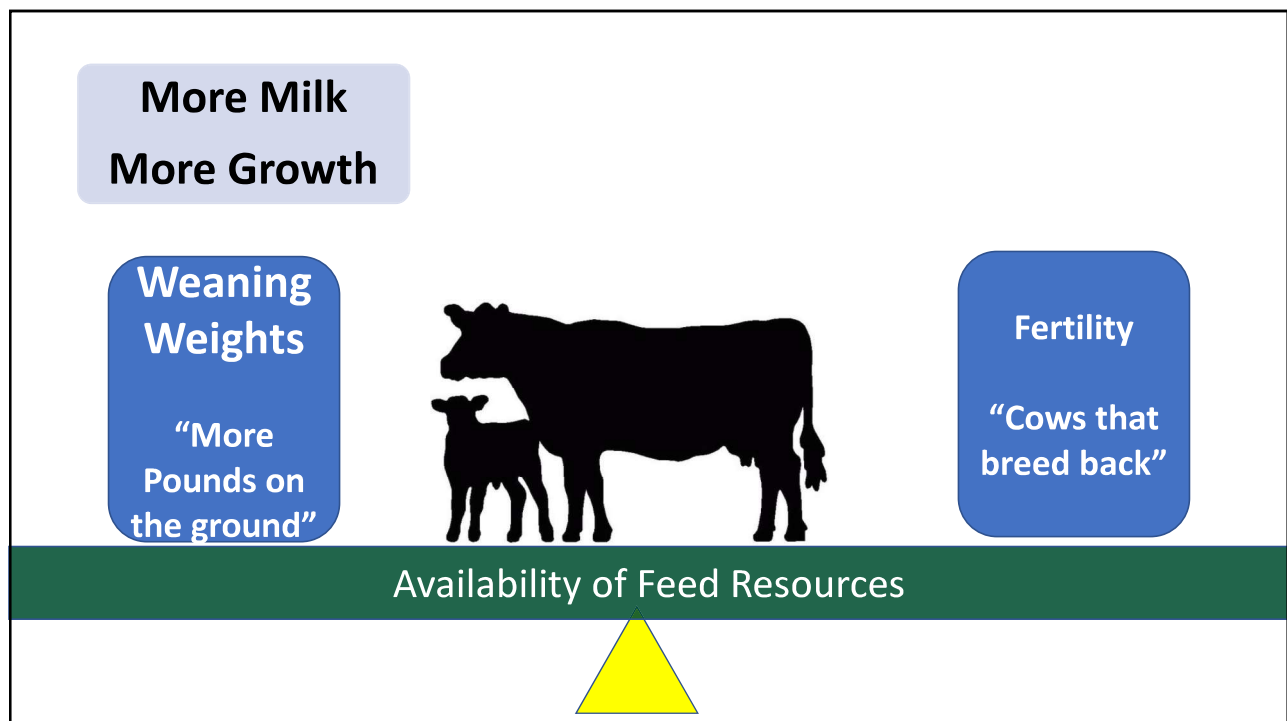
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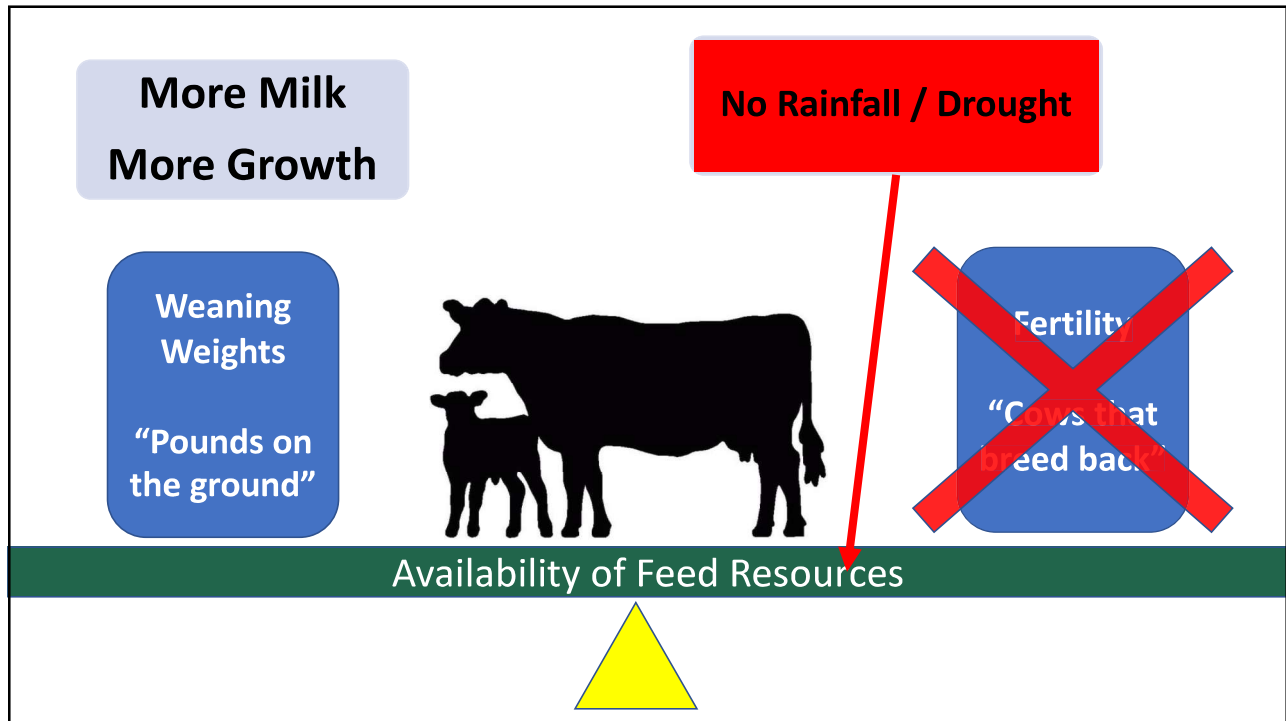
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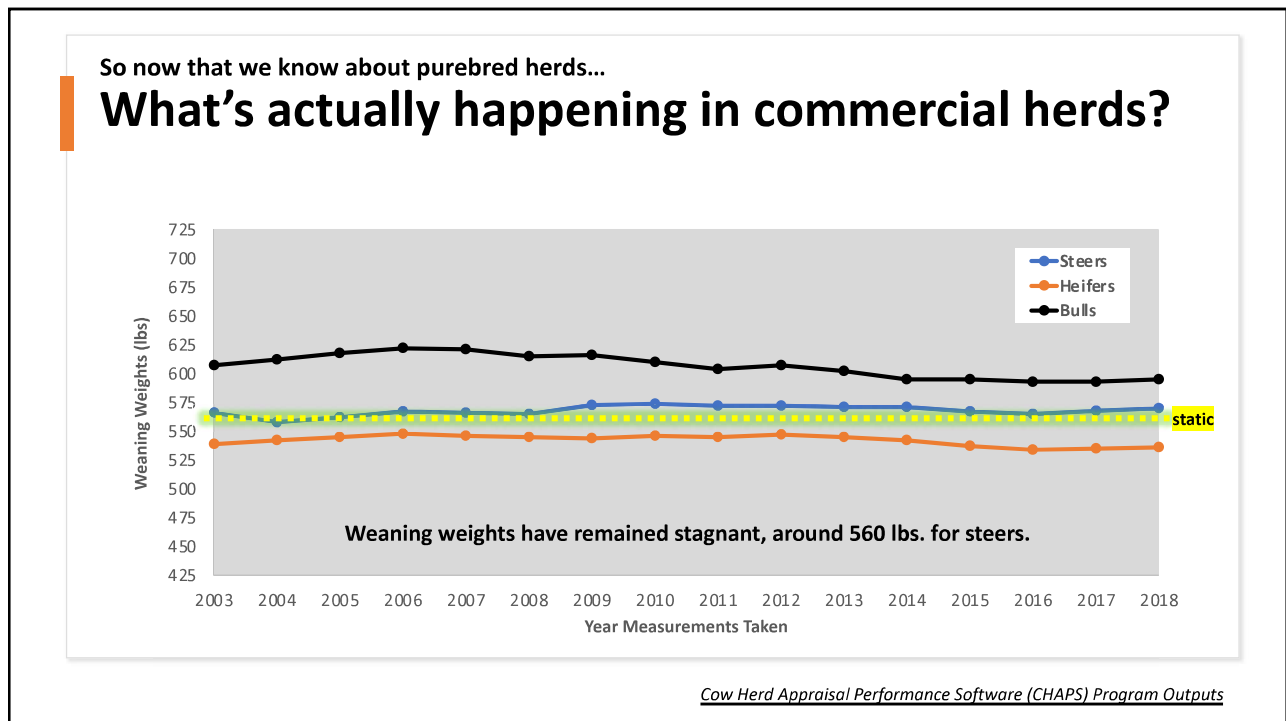
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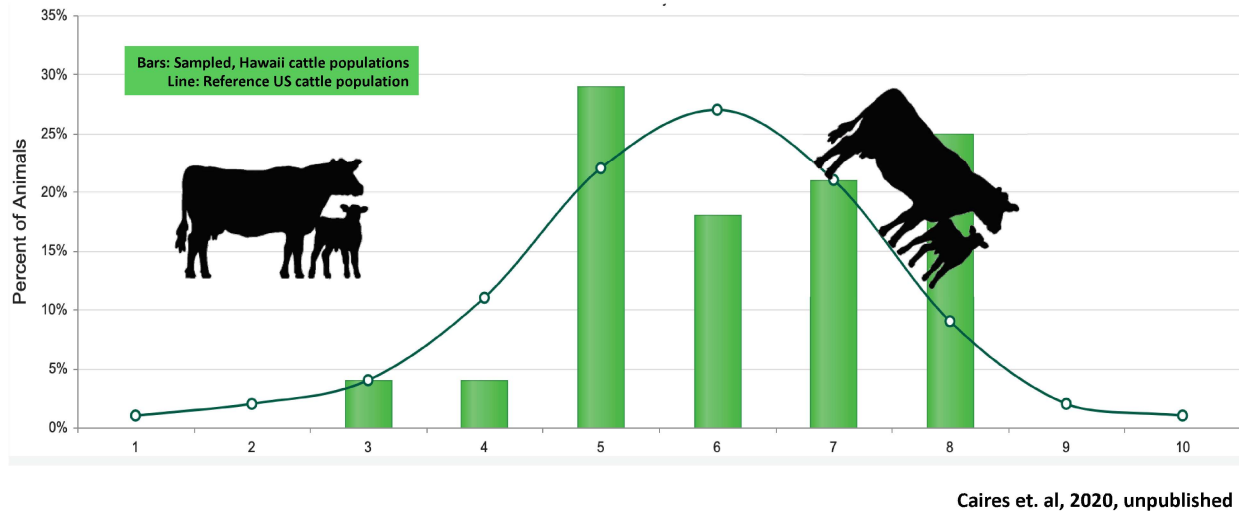


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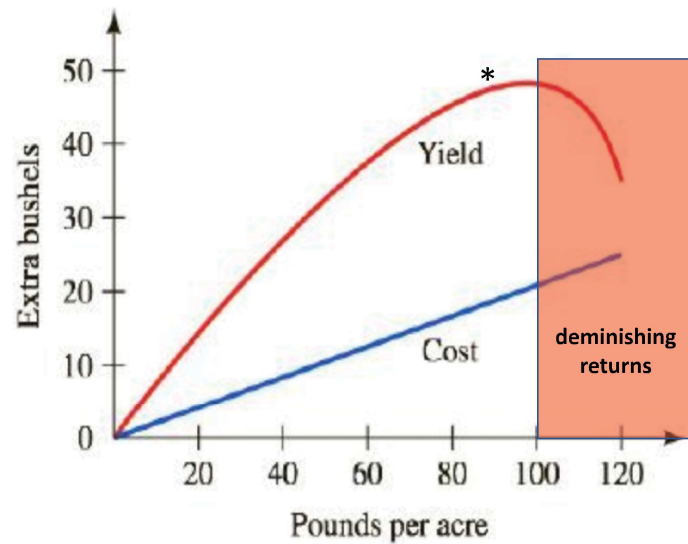
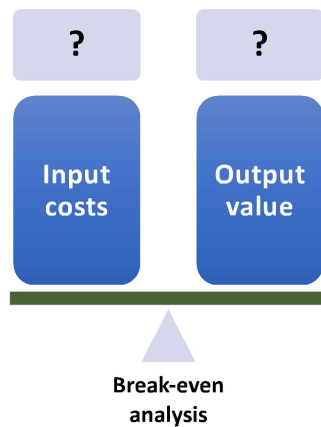
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Genomic Benchmark Data of Milk Production Levels in Hawai'i's Beef Cattle Herds



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Match production levels to environment & management!



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"The greater danger for most of us isn't that our aim is too high and miss it, but that it is too low and we reach it." - *Michelangelo*

HOW HIGH IS YOUR GOAL?

At Sahara, the unthinkable is commonplace...don't settle for less.



Production \neq Profit

Case Study: 220-acre corn farm

	Farm A	Farm B
Inputs* (Cost/Acre)	\$1,150	\$525
Yield Target (Bu/Acre)	350	180

Corn Price on September 22, 2020 = \$3.6925

	Farm A	Farm B
Total Inputs (\$)	\$253,000	\$115,500
Yield (Bushels)	73500	37800
Gross Value (\$)	\$271,215	\$139,482

	Farm A	Farm B
Net Return (\$)	\$18,215.00	\$23,982.00
Net Return (\$/acre)	\$82.80	\$109.01

*Doesn't include harvest costs: hauling, fuel, storage, marketing fees, drying costs, etc.

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It that always the case on this 220-acre corn farm?

	Farm A	Farm B
Inputs* (Cost/Acre)	\$1,150	\$525
Yield Target (Bu/Acre)	350	180

Corn Price on September 22, 2020 = \$3.6925/bushel

	Farm A	Farm B
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Net Return (\$/acre)	\$82.80	<u>\$109.01</u>

	Farm A	Farm B
Inputs* (Cost/Acre)	\$1,150	\$525
Yield Target (Bu/Acre)	350	180

Corn Price on September 22, 2025 = \$7.00/bushel

	Farm A	Farm B
Total Inputs (\$)	\$253,000	\$115,500
Yield (Bushels)	73500	37800
Gross Value (\$)	\$514,500	\$264,600

	Farm A	Farm B
Net Return (\$)	\$261,500.00	\$149,100.00
Net Return (\$/acre)	<u>\$1,188.64</u>	\$677.73

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Sire Selection: What are the considerations for milk levels?



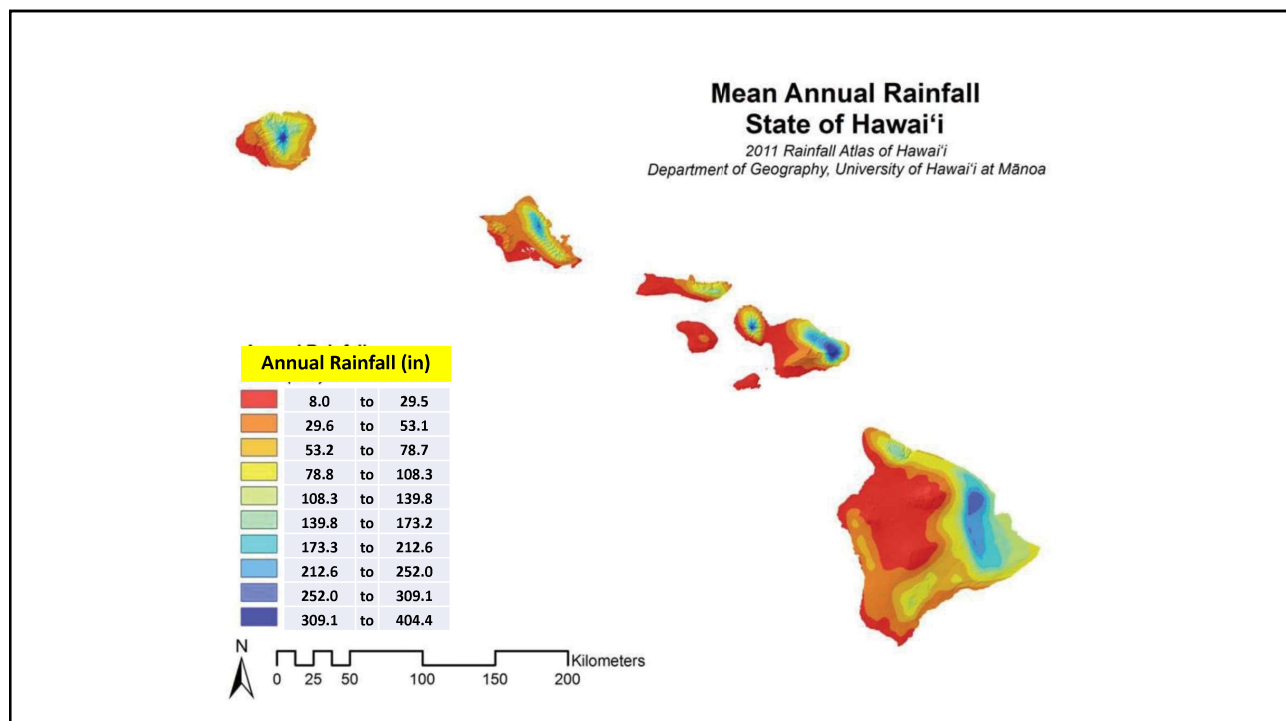
Mature Size

Milk Production

Feed / Rainfall Variability

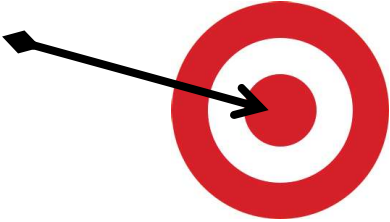
Feed Costs / Pasture Rents

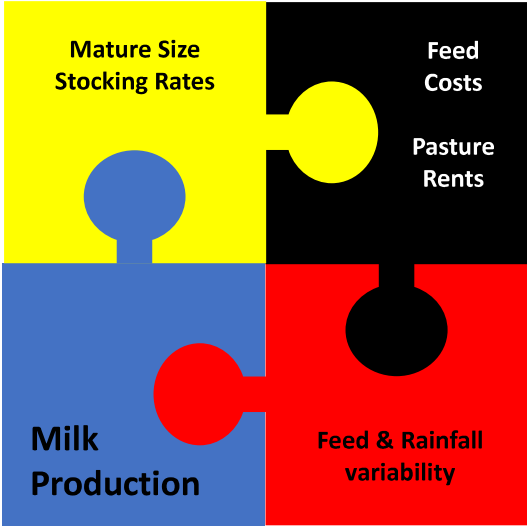
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Decision support tool to determine the optimal level of milk for your cow herd!

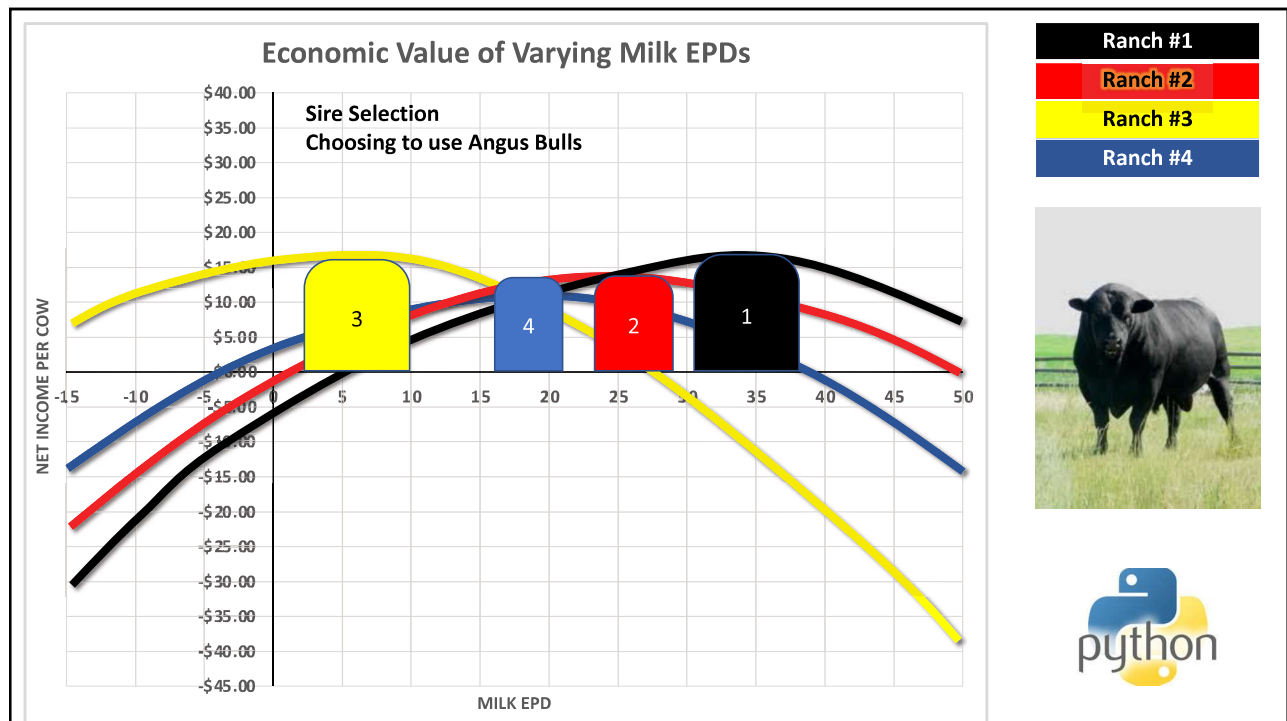




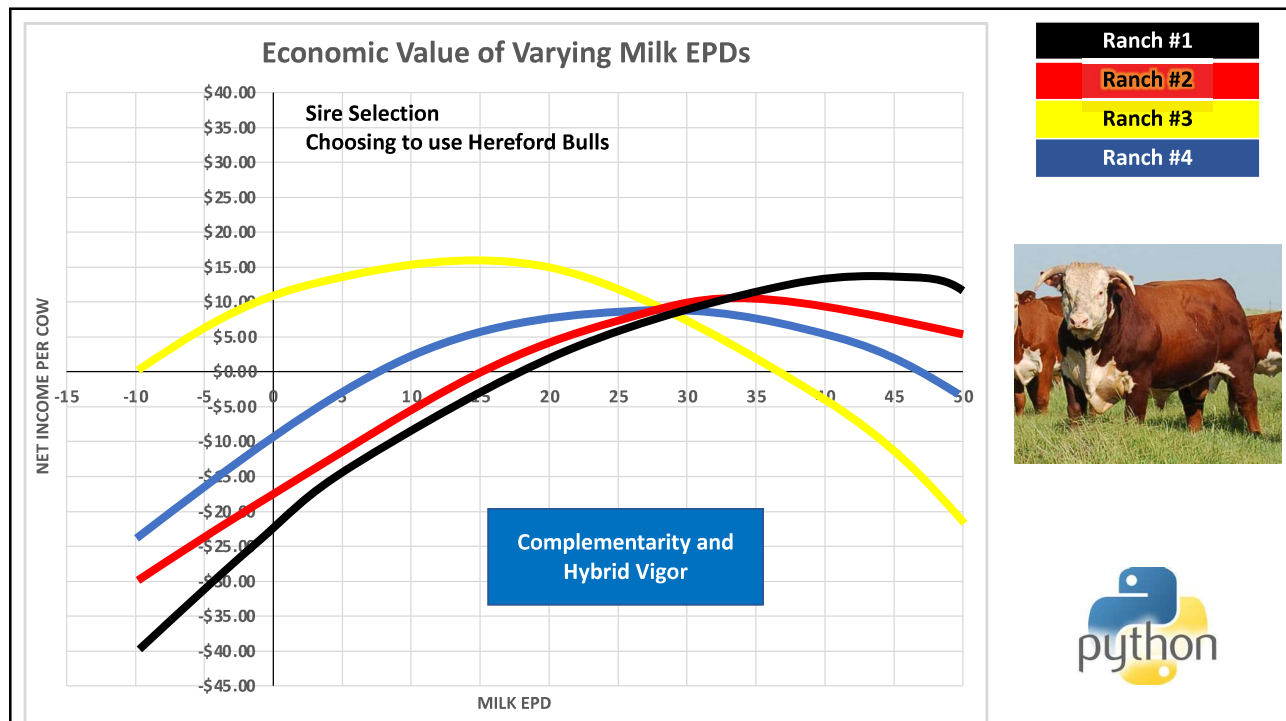
Put the tool to work

4 island ranches, each with different production environments and sire selection needs

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If the current milking ability of your cowherd is:

TOO HIGH

- consider using one generation of sire's that fall on **LOWER END** of your optimal range, then stay within optimal

TOO LOW

- consider using one generation of sire's that fall on **HIGHER END** of your optimal range, then stay within optimal

JUST RIGHT

- select and use sire's that fall within the optimal Milk range.

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**How do you
balance
production levels
to match your
environment &
management?**

Reach out!

Dr. Kyle Caires
kccaires@hawaii.edu

Bull Selection

- Choose a seedstock supplier that raises them like you do!
 - Bulls/semen
- Selection tools:
 - Individual performance
 - EPDs, Genomics
 - Selection indices
 - Independent culling levels
 - Performance pedigrees
 - Visual appraisal
- Mating systems
 - Straight breeding
 - Cross breeding
 - Complementarity
- Select bulls from dams with a strong track record of success

Heifer Selection

- Choose a seedstock supplier that raises them like you do!
 - Often, its you
- Select heifers from dams with a strong track record of success
 - Calves early; repeats
 - Record keeping
- Selection tools:
 - Individual performance
 - Visual appraisal
 - Reproductive tract scoring
 - Genomics
- Mating systems
 - Straight breeding
 - Cross breeding

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Strategies for success?



**Advances in
Technology**

**Common
Sense**



**Improve
Production
- and/or -
Improve
Profit**

**Contact me if you
have any questions**



Dr. Kyle Caires
kccaires@hawaii.edu

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