

Strategically using reproductive technologies to increase profitability

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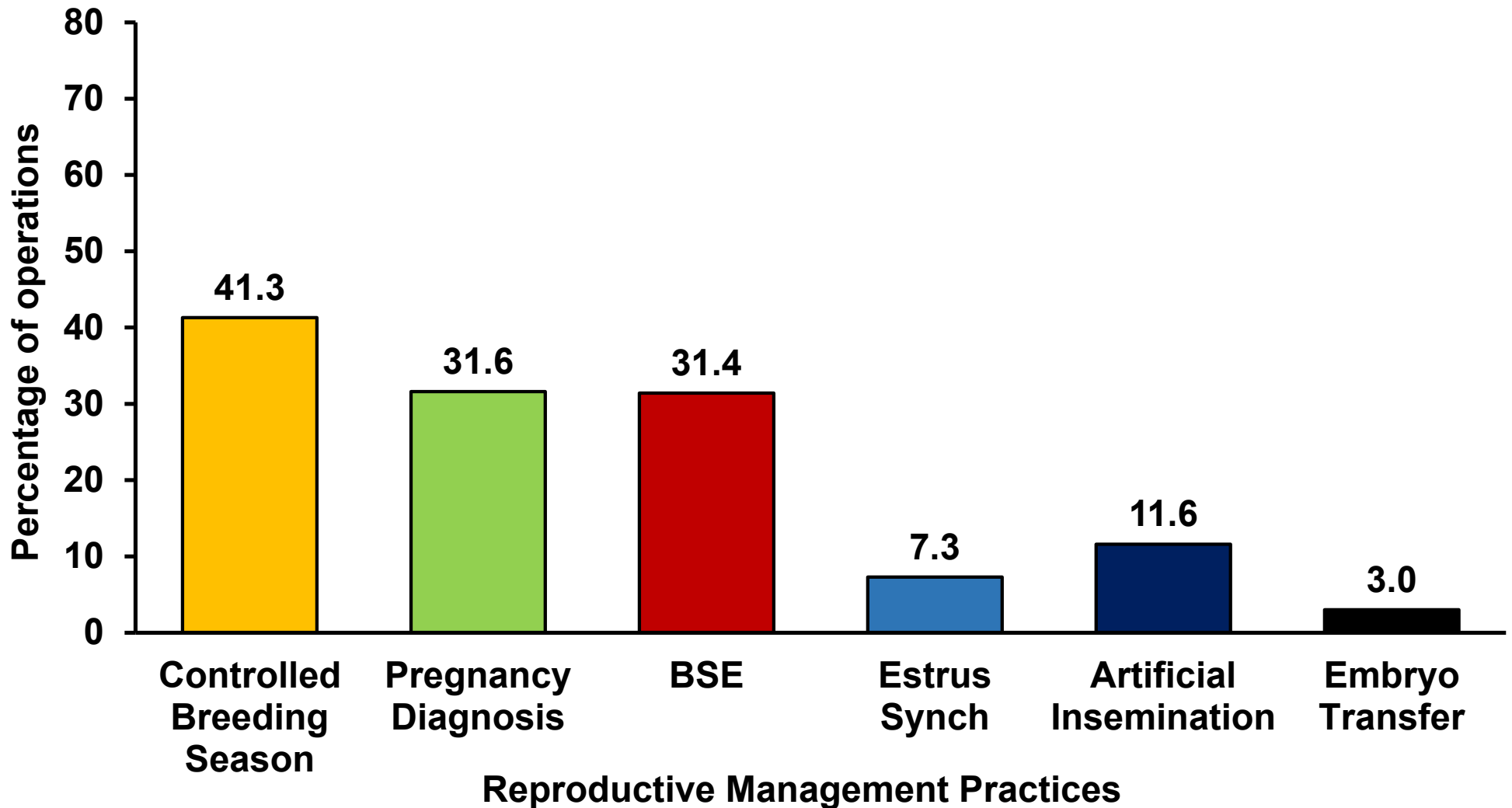
UNIVERSITY OF
GEORGIA

What drives performance in cattle?

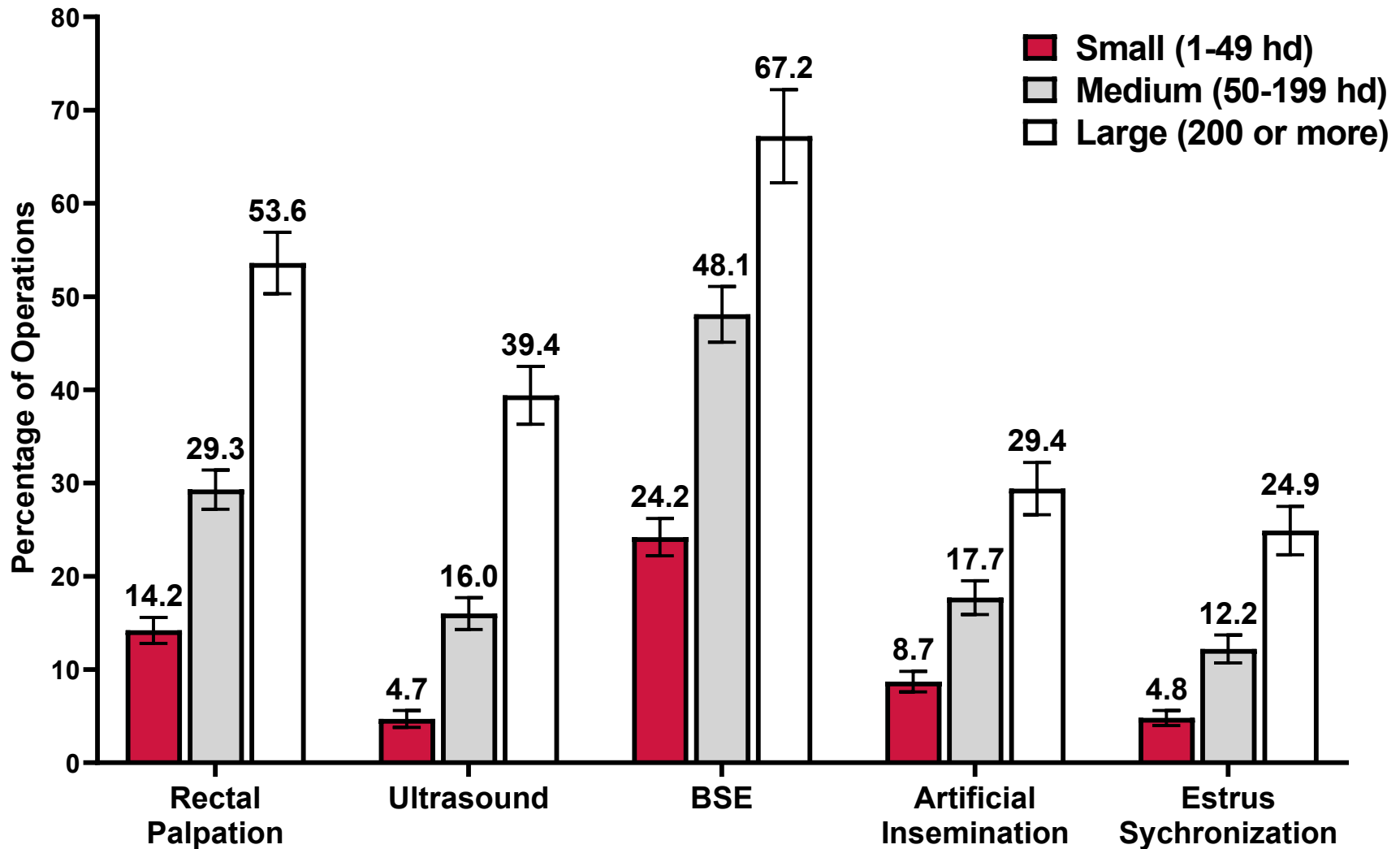


**Use of reproductive technologies
influences both!**

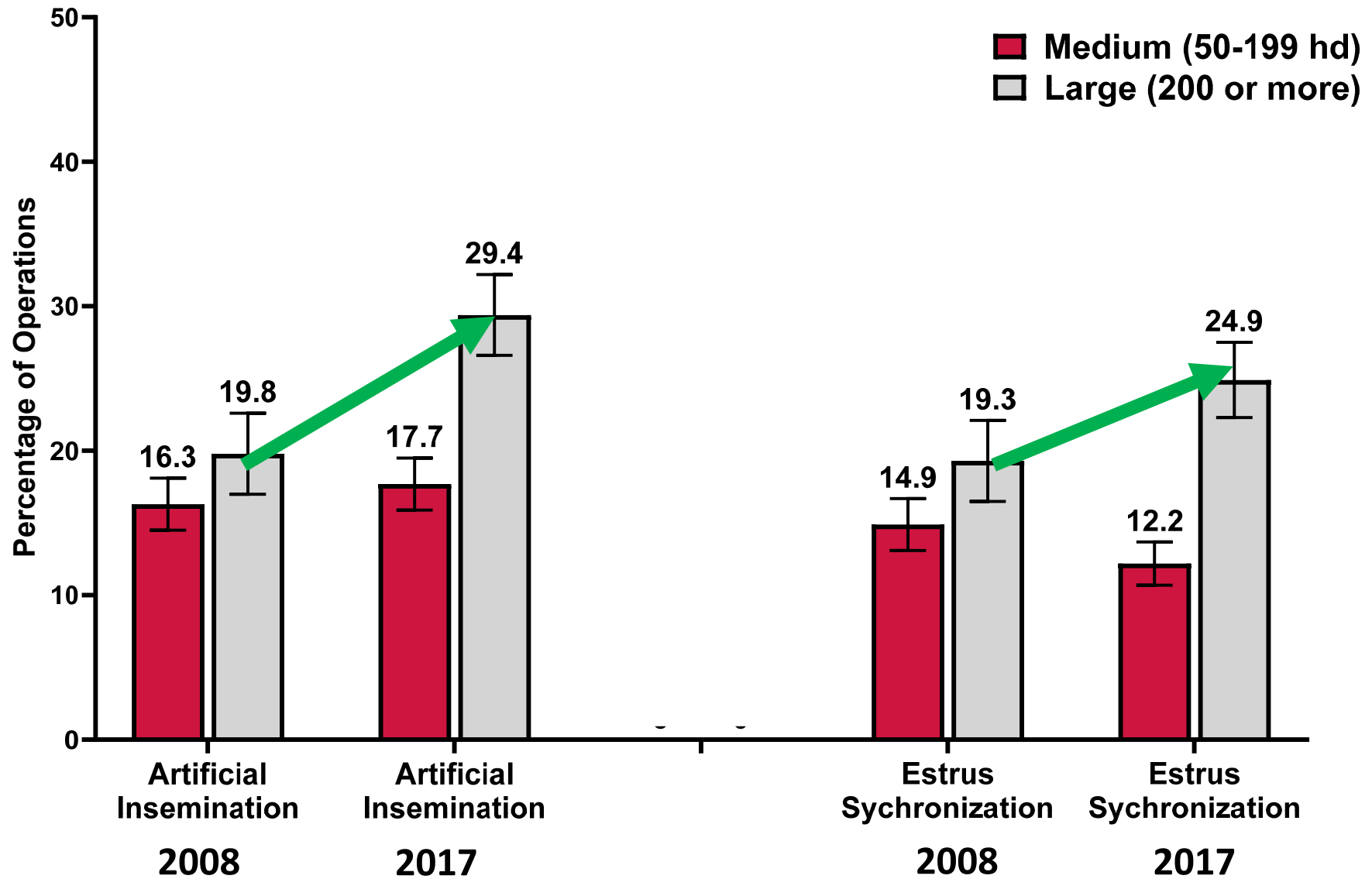
Adoption of reproductive management strategies in the United States



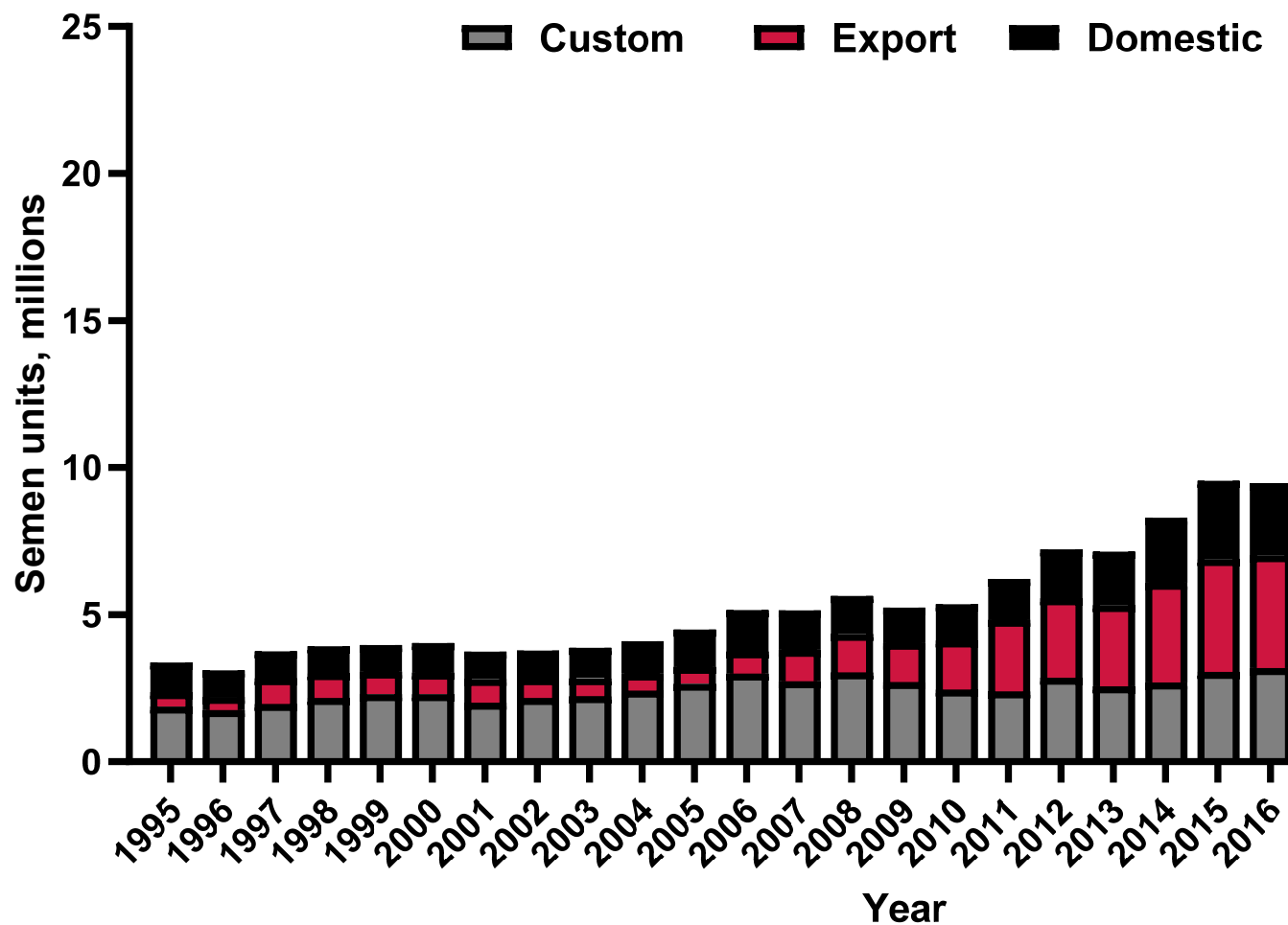
Adoption of reproductive management strategies in the United States



Changes in the use of estrus synchronization and AI

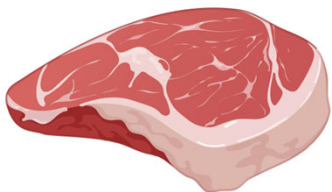


U.S. Beef Semen Sales

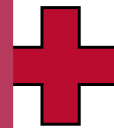


What are we missing out when we fail to adopt reproductive technologies?

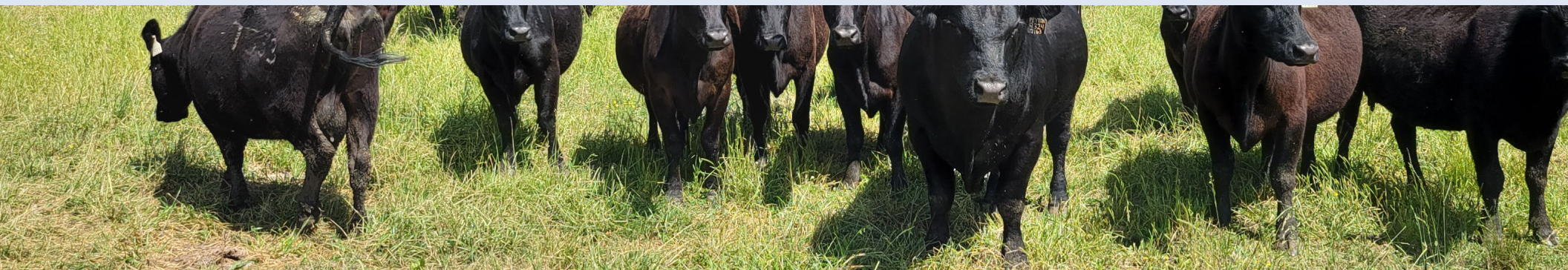
Phenotypic
Variation



Genetic
Variation



Environment
Effect



Genetic advantage of superior sires

AI-sire

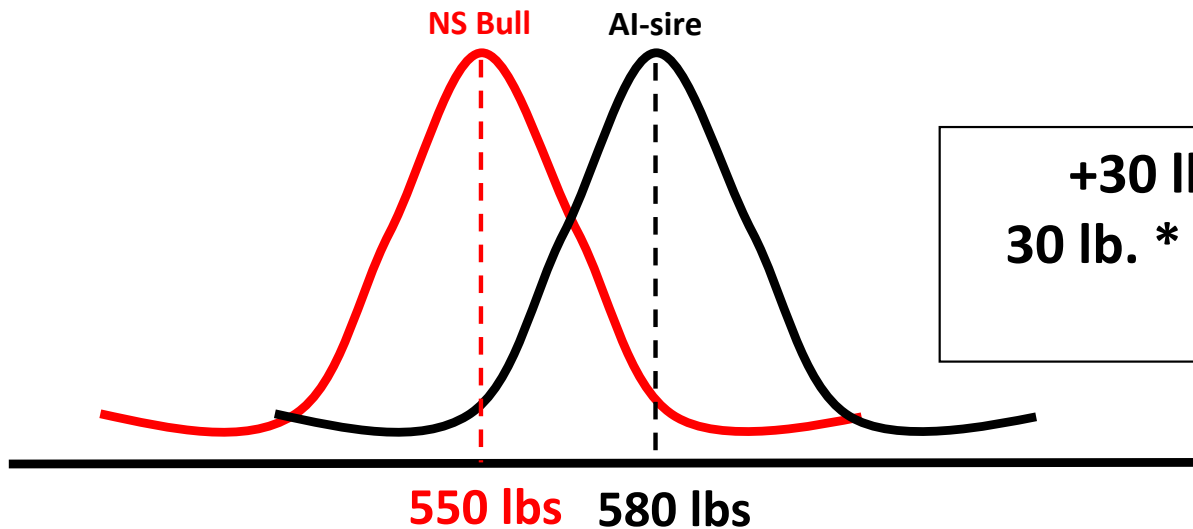


WW EPD = +95 lbs

Natural Service Sire



WW EPD = +65 lbs

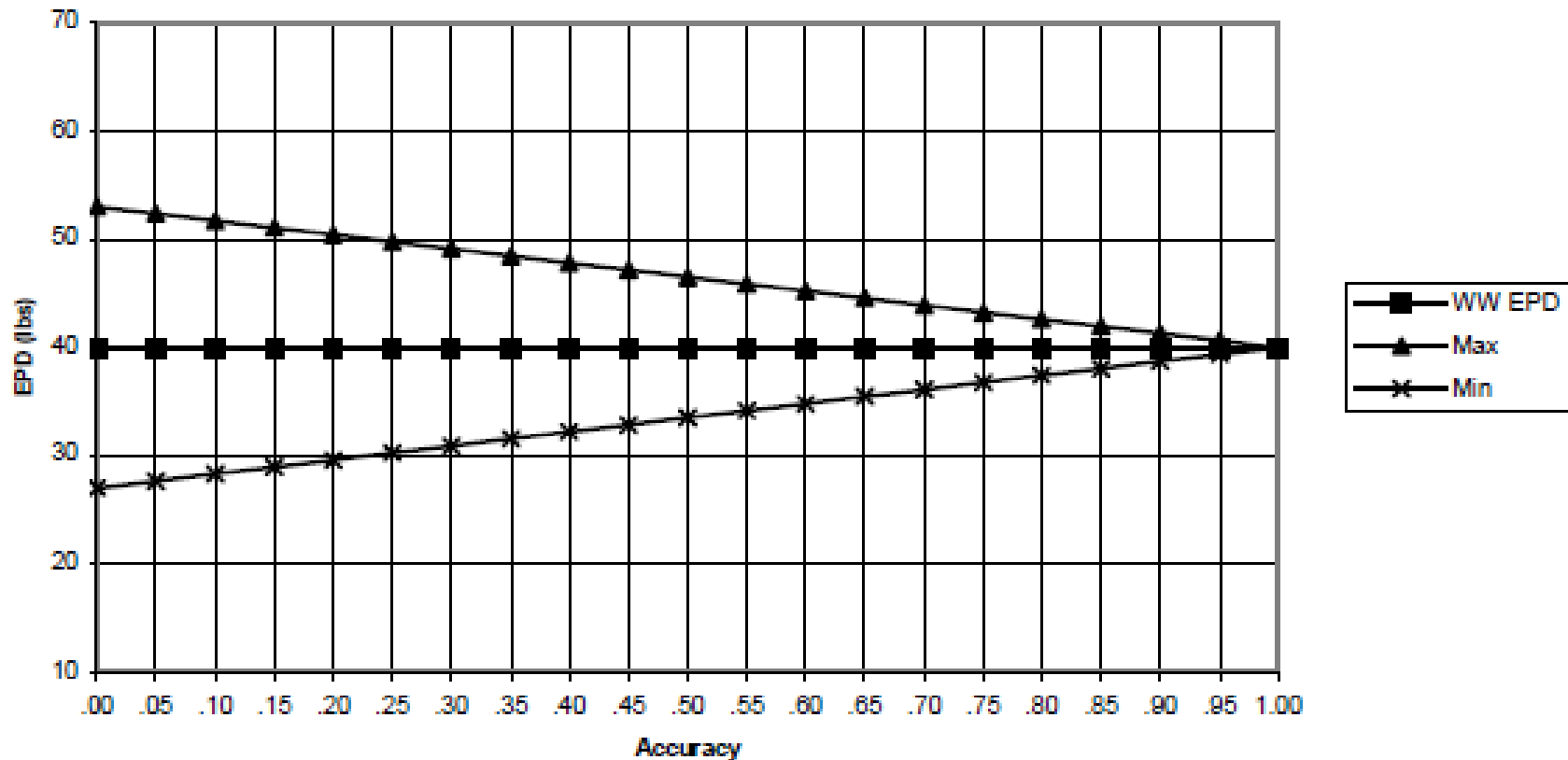


+30 lb. advantage
30 lb. * 2.61\$/lb. = **\$78**
per calf



Predictability of proven sires

Possible Change of WW EPD at Varying Accuracies

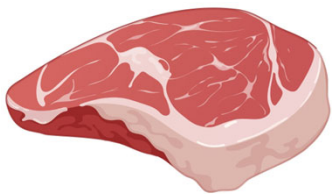


WW 70 and Accuracy of 0.40: Actual EPD can range by 9.4 lb.



What are we missing out when we fail to adopt reproductive technologies?

Phenotypic
Variation



Genetic
Variation



Environment
Effect



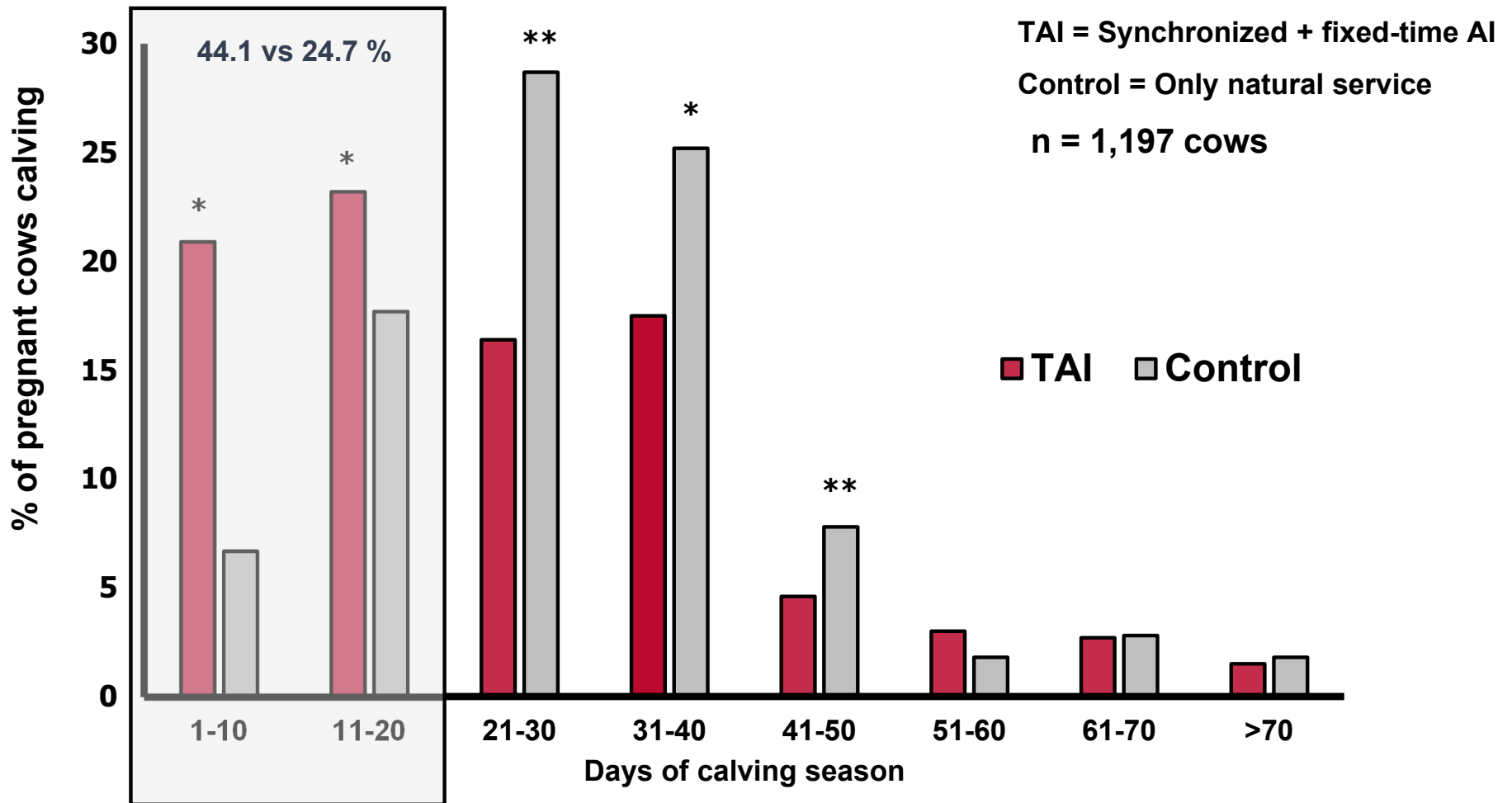
Estrus synchronization and fixed-time AI: Beyond genetic improvement

Control

Natural mating



Impact of estrus synchronization on calving distribution



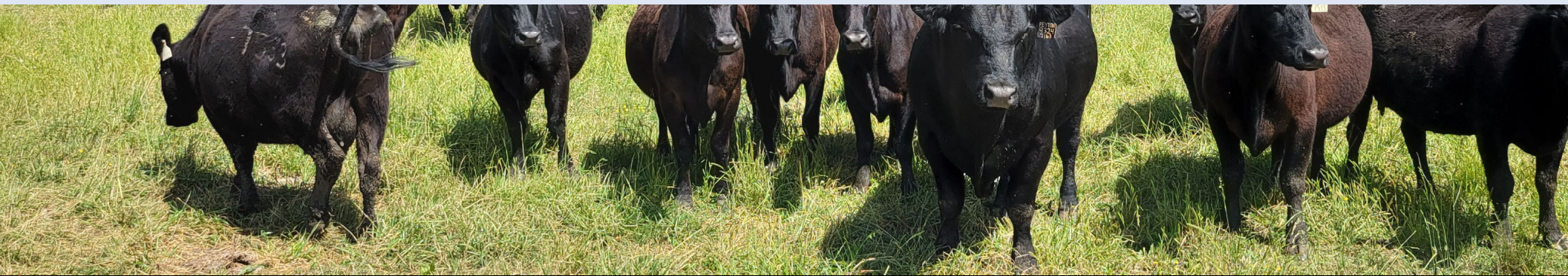
How does estrus synchronization influences calf performance?

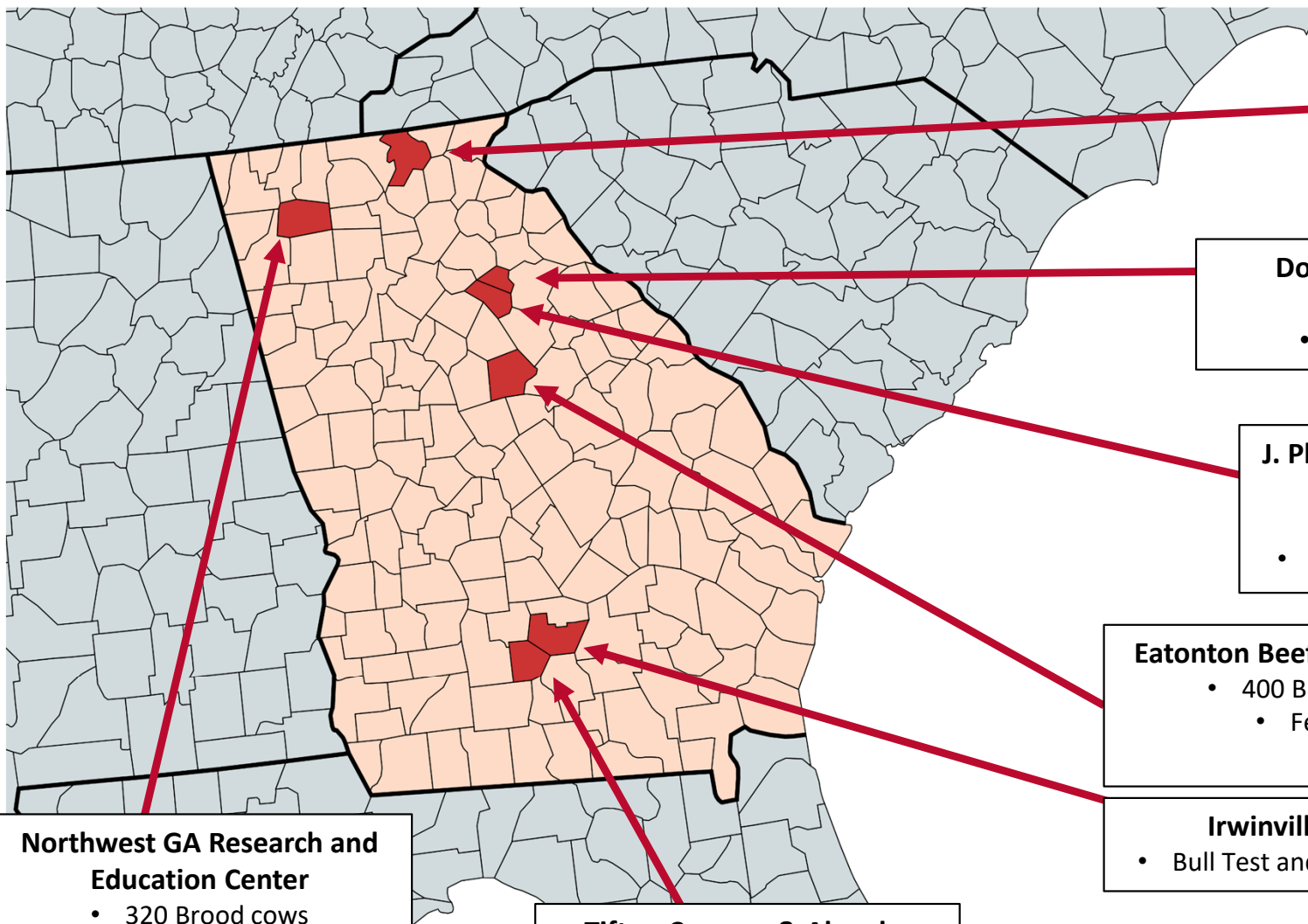
Item	Treatment	
	Control	TAI
No. of cows	615	582
Weaning weight per cow exposed, lb	387 ± 8 ^a	425 ± 8 ^b

^{ab} Means within row differ (P < 0.01)

+38 lb. advantage
38 lb. * 2.61 \$/lb. = \$99.18
per cow exposed

Impact of calving distribution on cow herd fertility





Georgia Mountain Station

- Custom stockering
- 150 head capacity

Double Bridges Farm
Teaching Herd

- 40 Brood cows

J. Phil Campbell Research and Education Center

- 180 Brood cows
- Replicated grazing pastures

Eatonton Beef Research Unit

- 400 Brood cows
- Feedlot

Irwinville Station

- Bull Test and HERD Program

Northwest GA Research and Education Center

- 320 Brood cows
- Bull Test and HERD Program

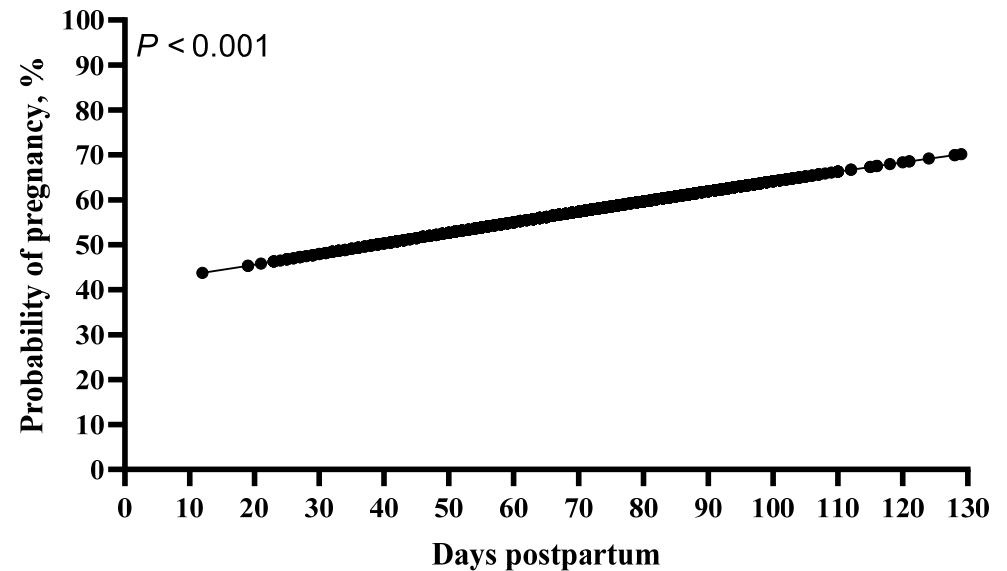
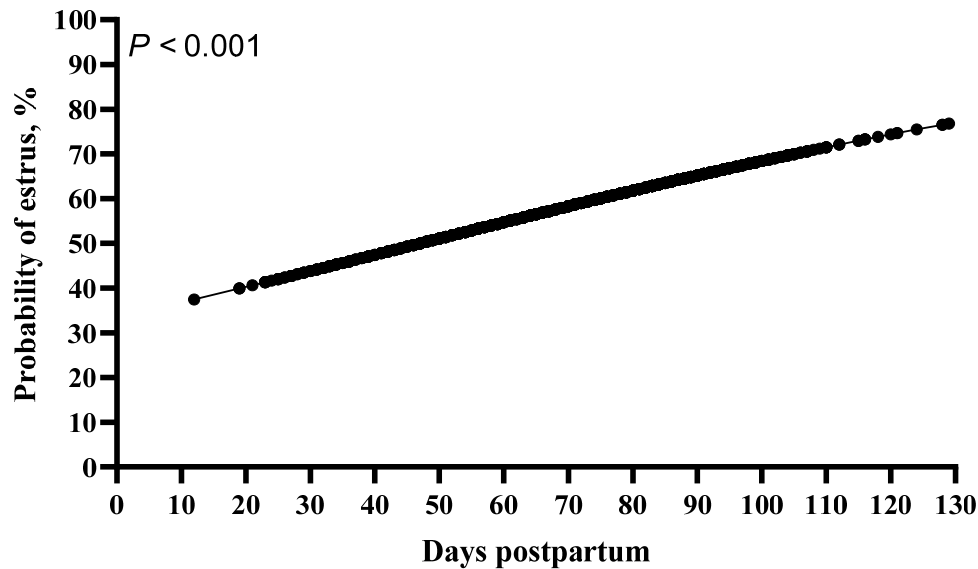
Tifton Campus & Alapaha Range Station

- 220 Brood cows
- Replicated grazing pastures



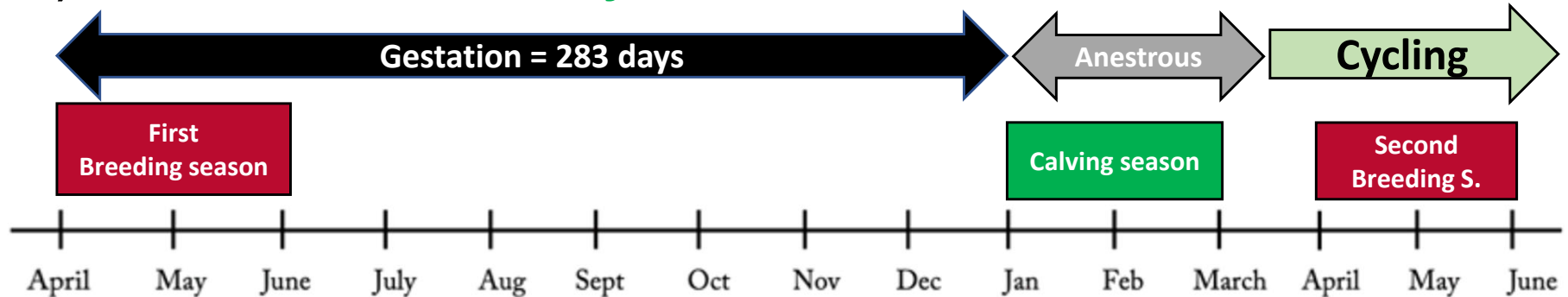
Impact of days postpartum on estrus expression and pregnancy rates

n = 1,280

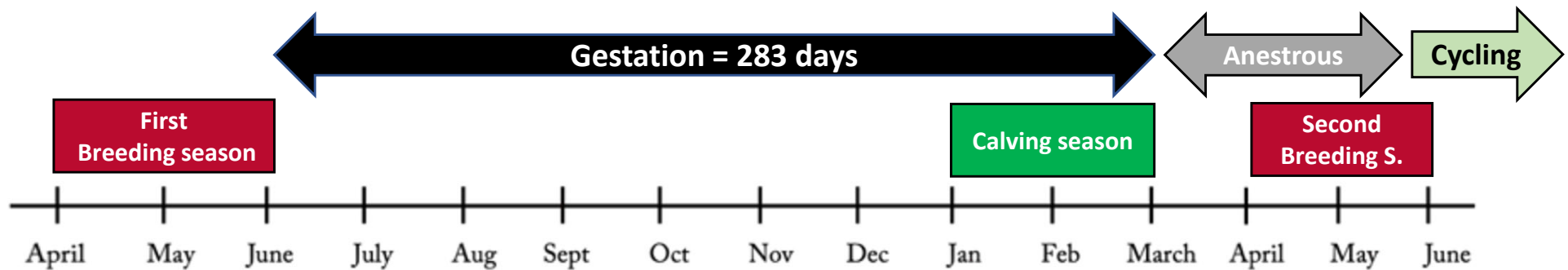


Why do they breed back better?

A) When a cow breeds **early**

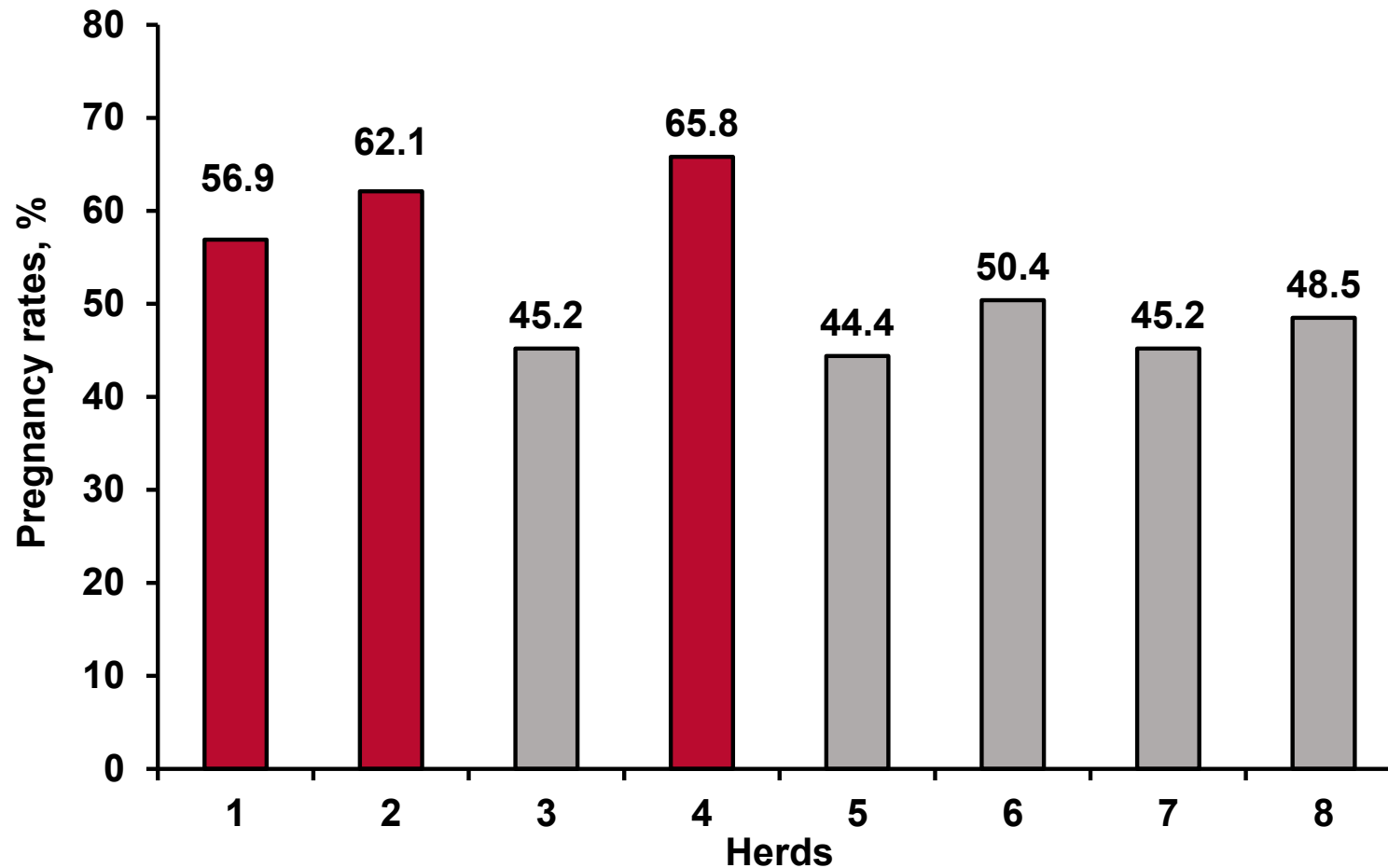


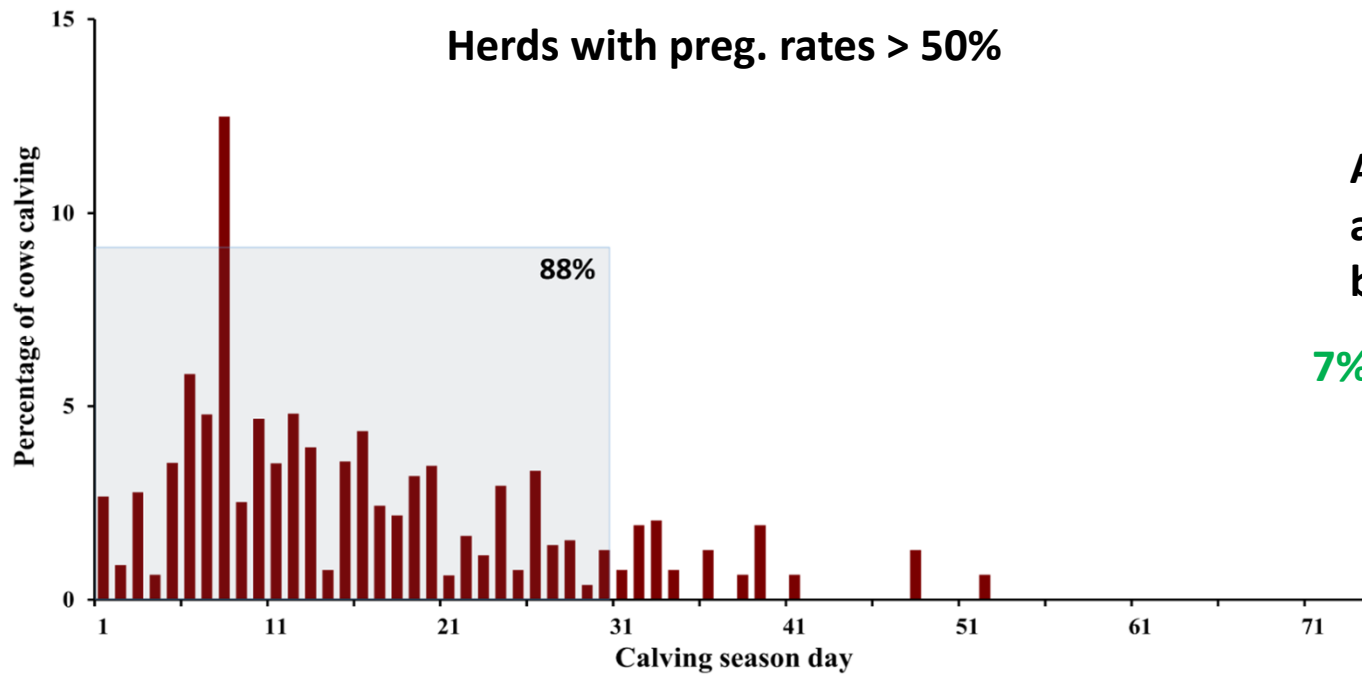
B) When a cow breeds **late**



Exploring variation in FTAI results between different herds

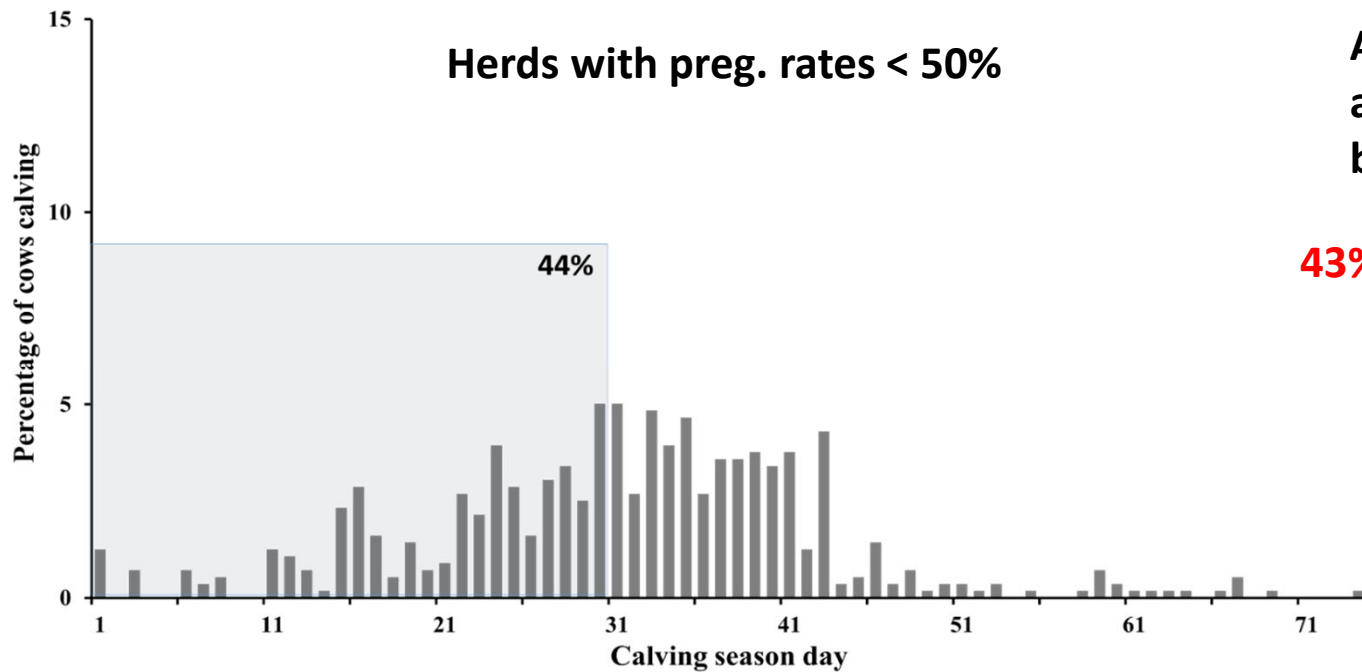
- n = 1541 postpartum cows
- 8 different herds exposed to Fixed-Time Artificial Insemination





Average days postpartum at the beginning of the breeding season = **79 days**

7% of cows < 50 DPP at start of the next breeding season



Average days postpartum at the beginning of the breeding season = **64 days**

43% of cows < 50 DPP at start of the next breeding season

Impact of Day of Conception on Replacement Heifers Performance



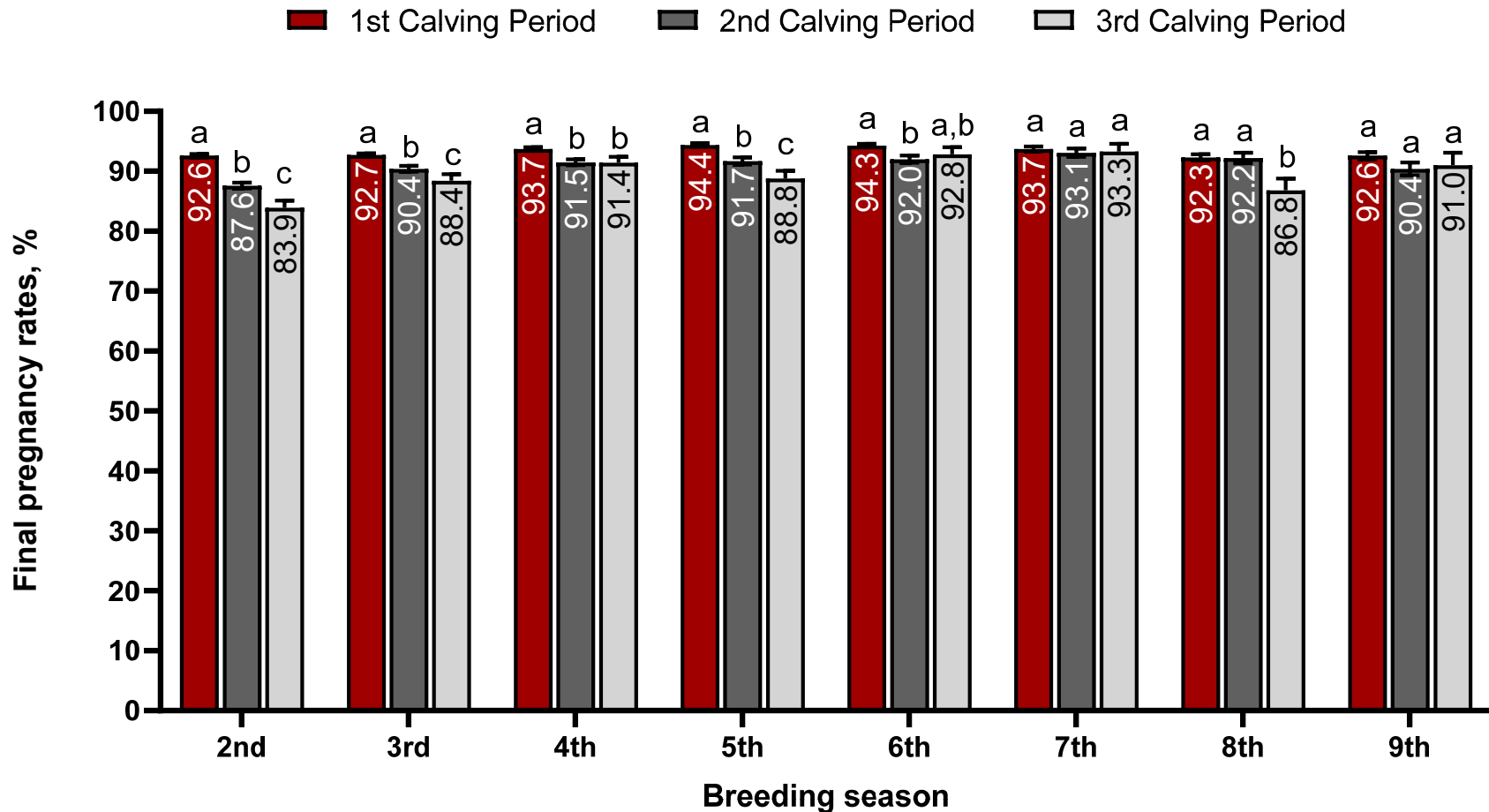
Effects of calving distribution on **offspring** performance

Heifer progeny

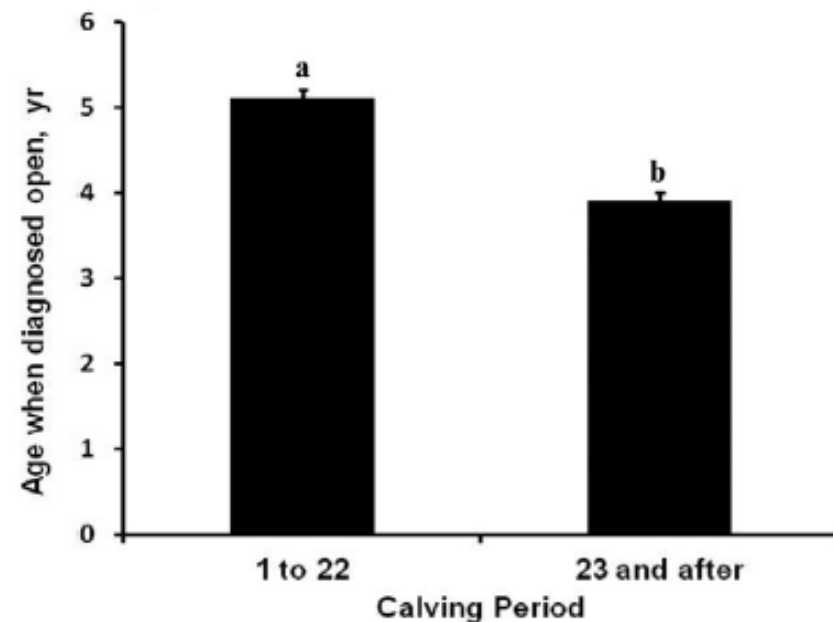
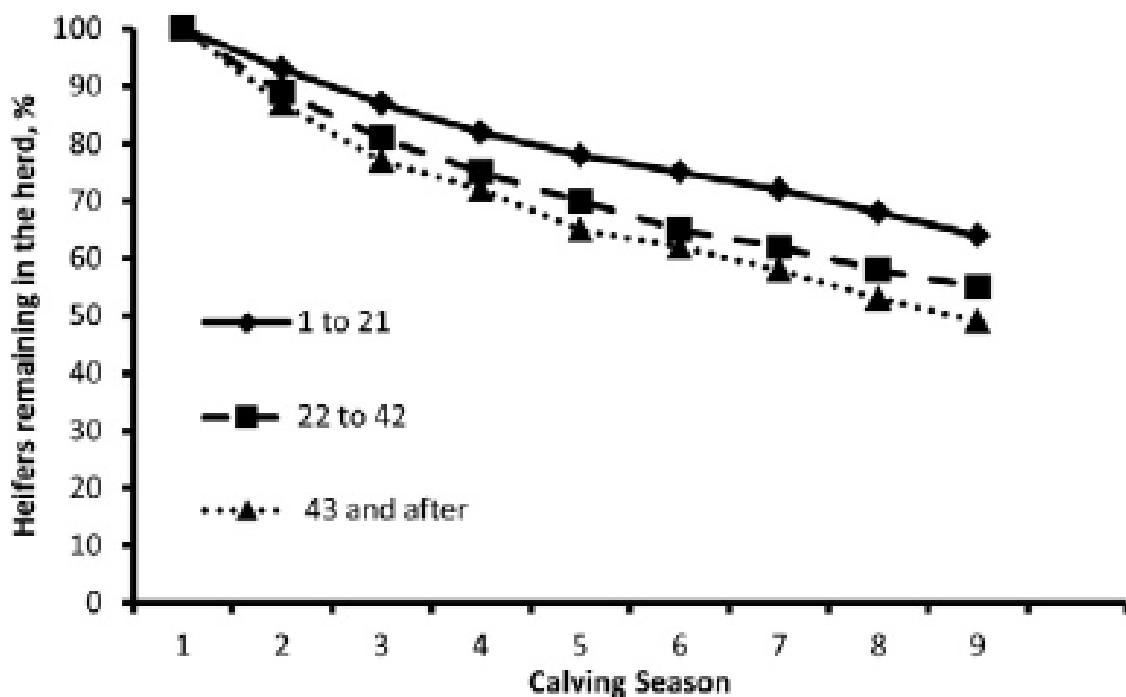
Item	Period of calving, 21 d intervals		
	1 st	2 nd	3 rd
Prewaning ADG, lb	1.83	1.83	1.90
Weaning weight, lb	483 ^a	470 ^b	434 ^c
Prebreeding ADG, lb	0.90	0.90	0.90
Prebreeding weight, lb	653 ^a	644 ^b	609 ^c
Cycling, %	70 ^a	58 ^b	39 ^c
Pregnancy rate, %	90 ^a	86 ^a	78 ^c
Calved in 1 st 21 d, %	81 ^a	69 ^b	65 ^b



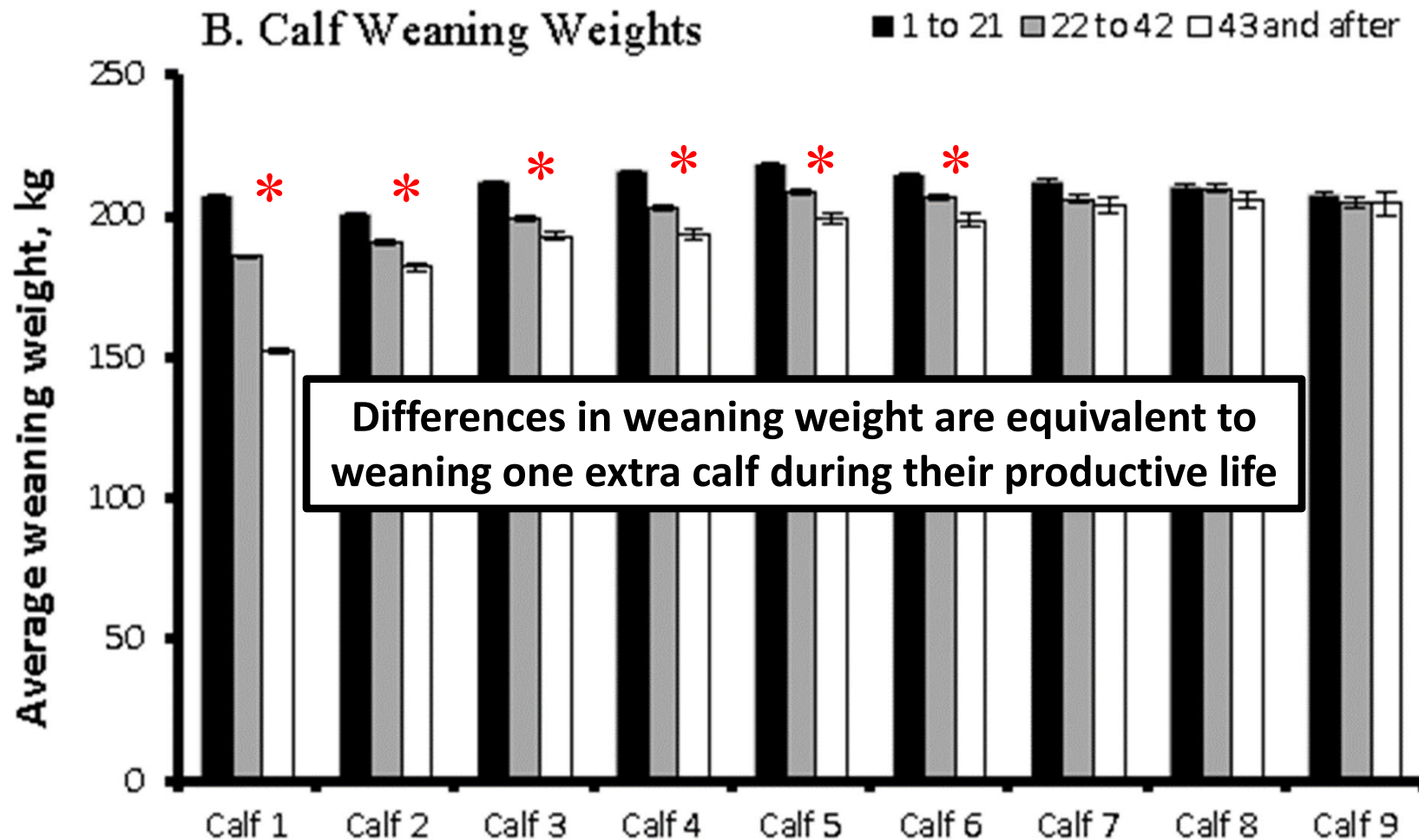
Effects of Calving Date **as Heifers** on Lifelong Female Productivity - Fertility



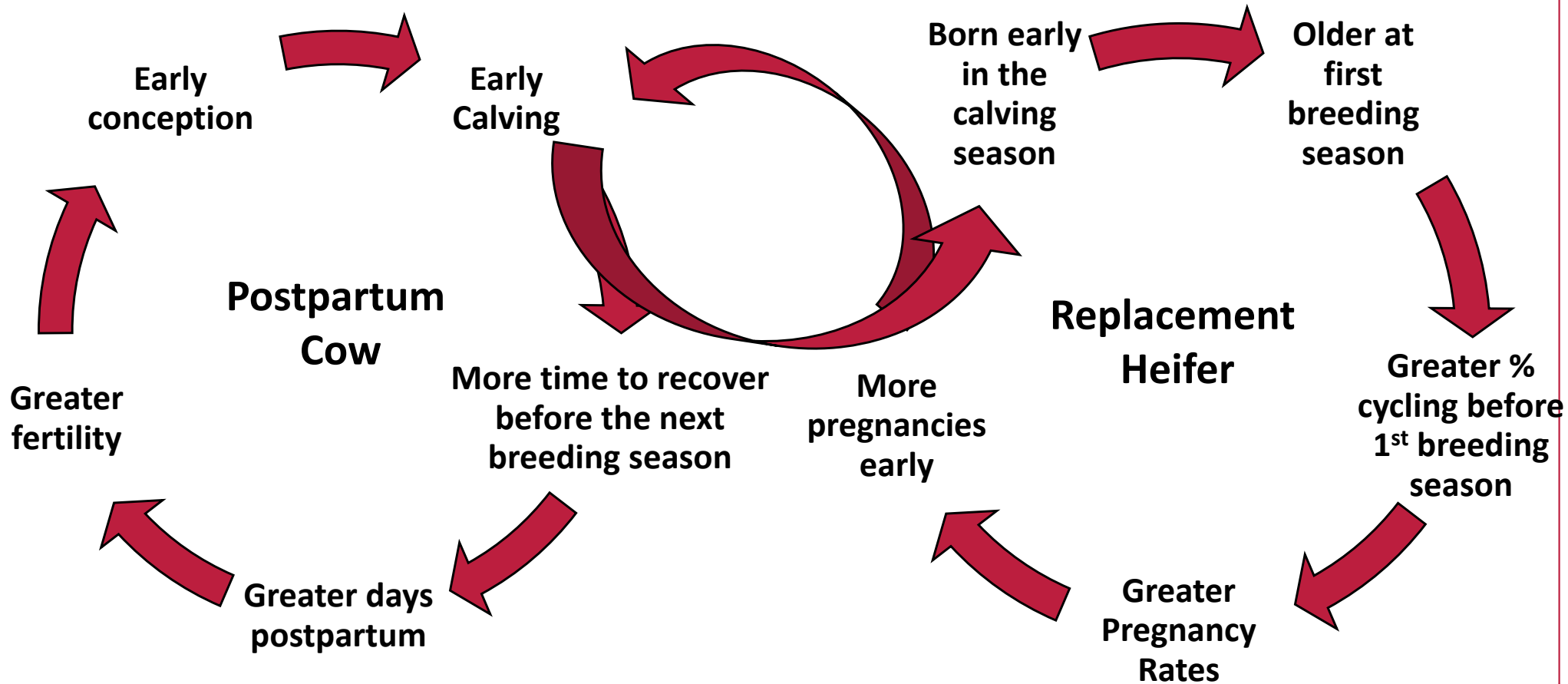
Effects of Calving Date **as Heifers** on Lifelong Female Productivity - Longevity



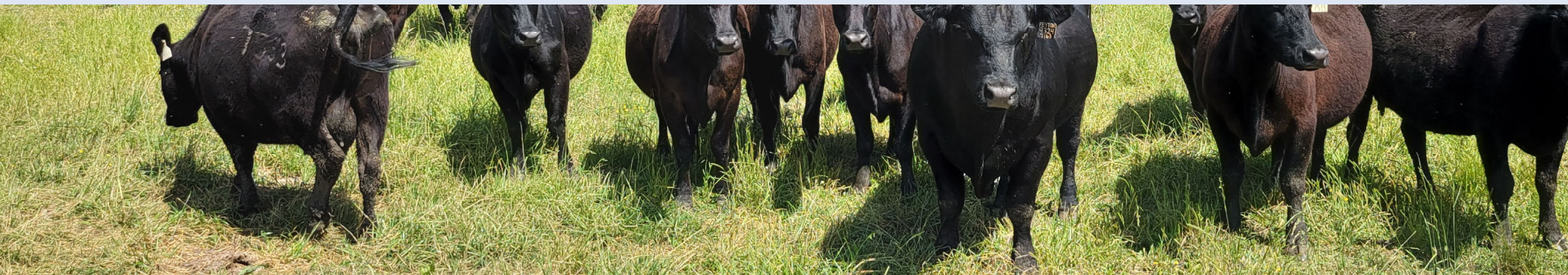
Effects of Calving Date **as Heifers** on Weaning Weights



Early Conception and the Cycle of High Fertility



Examples of Successful Adoption of Reproductive Technology in the Southeast



Leveraging Active Reproductive Management

The North Florida Research and Education Center – Case Study



Dr. Cliff Lamb



2007

Start breeding season



1

Remove bulls



120



2012

AI heifers



1

AI cows



8

Remove bulls

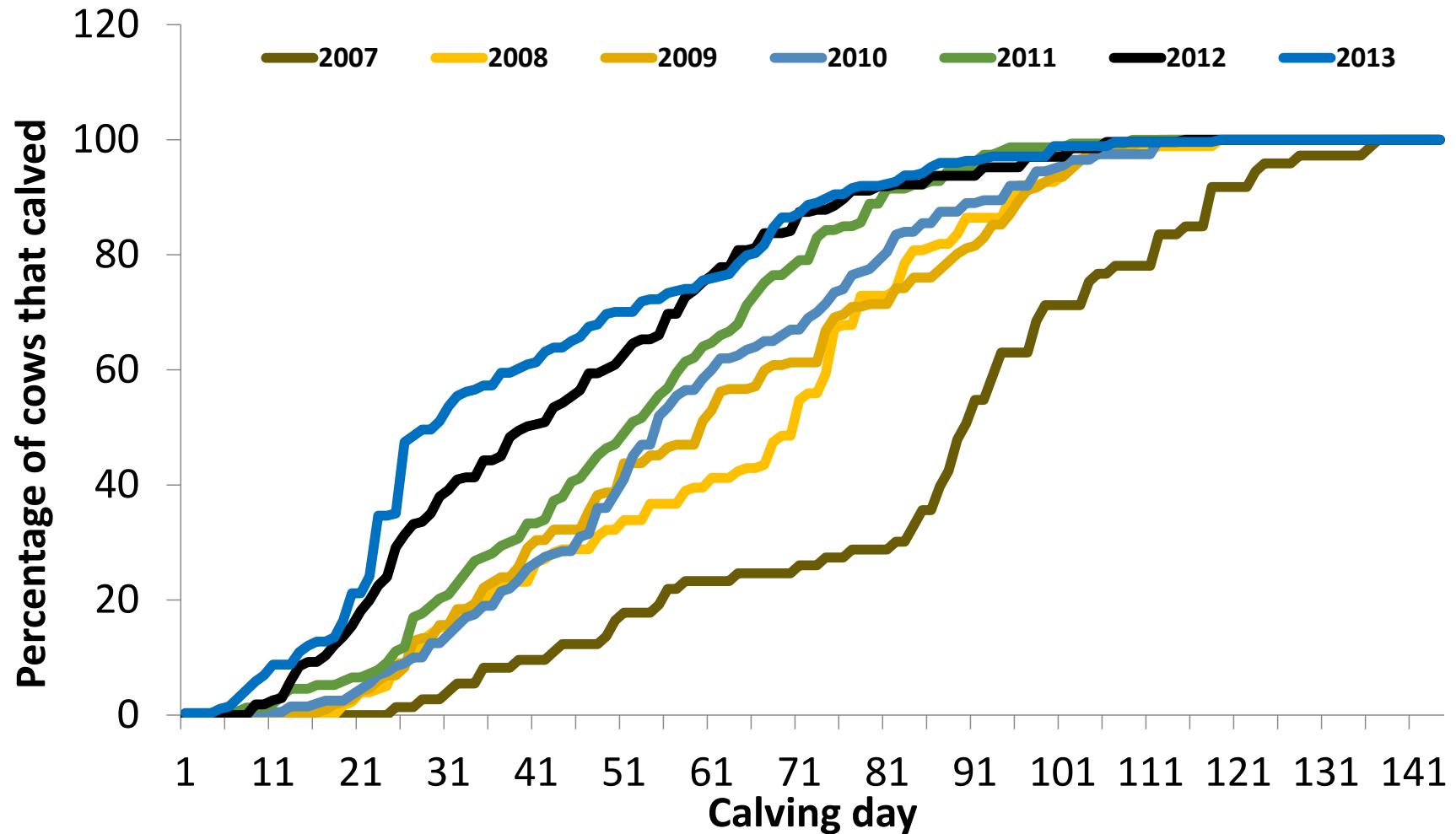


70

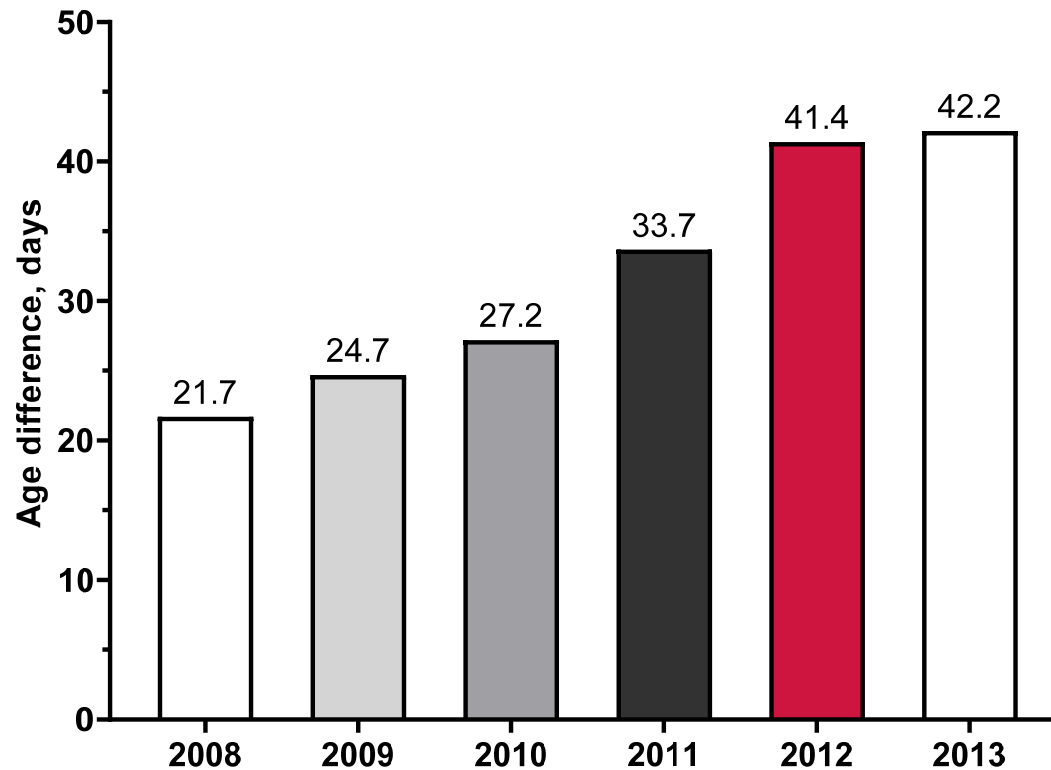
- 1. Decrease the length of the breeding season (~10 days per year)**
- 2. Culling non-pregnant and less fertile females**
- 3. Keeping replacement heifers that conceive in the first 21 days**
- 4. Intensive use of estrus synchronization**



NFREC case study



Proactive reproductive management alters average age at weaning

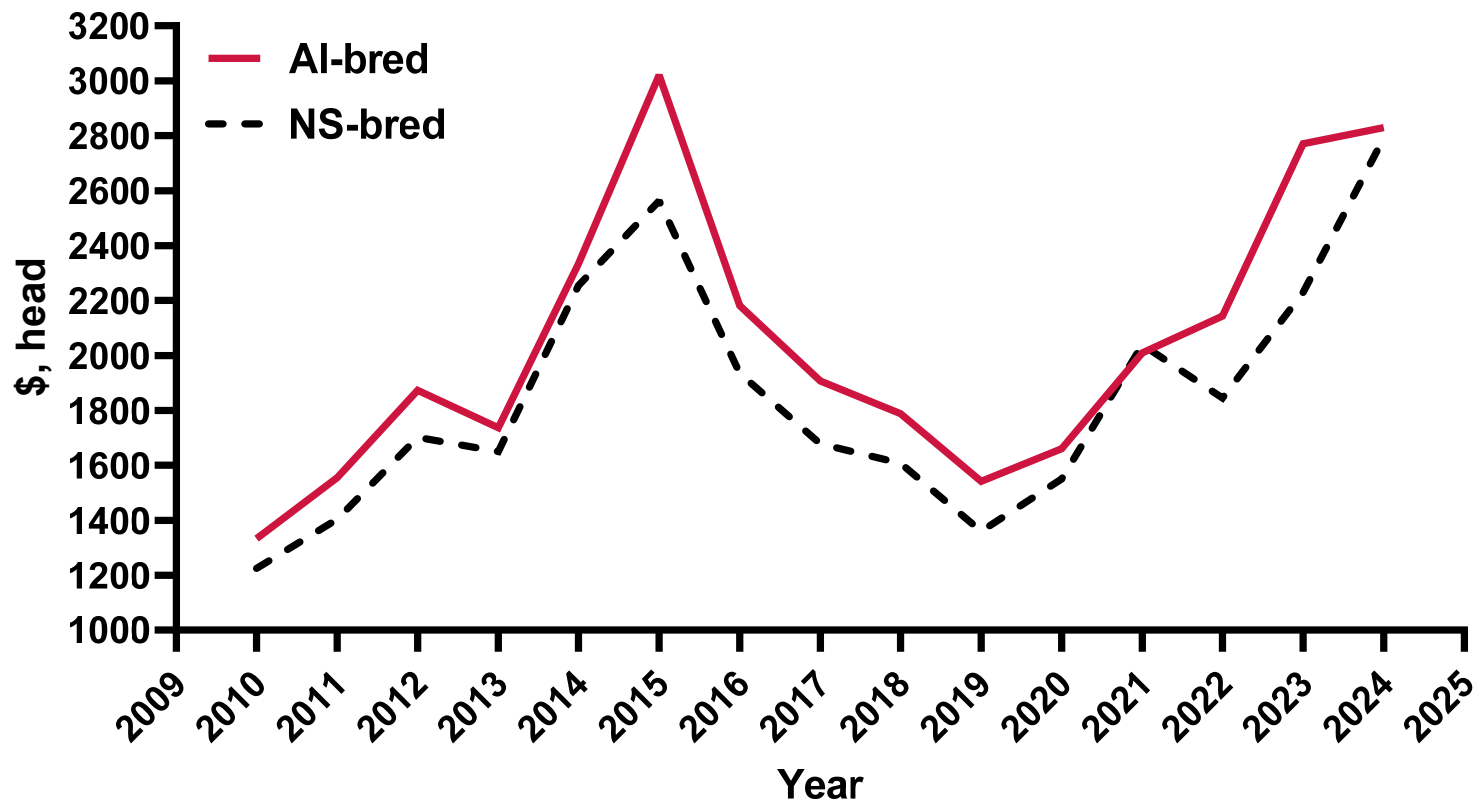


Changes in fertility and calf value

Year	2006	2007	2008	2009	2010	2011	2012	2013
Pregnancy Rates	81%	86%	84%	86%	82%	94%	92%	93%

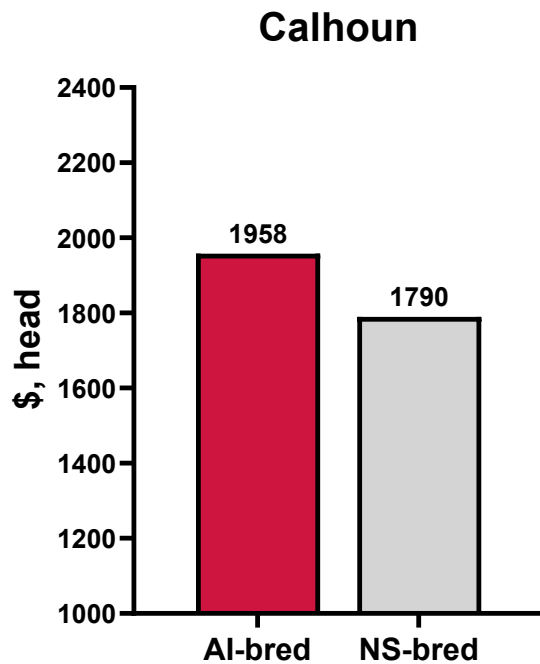


Value of artificial insemination when selling bred replacement heifers

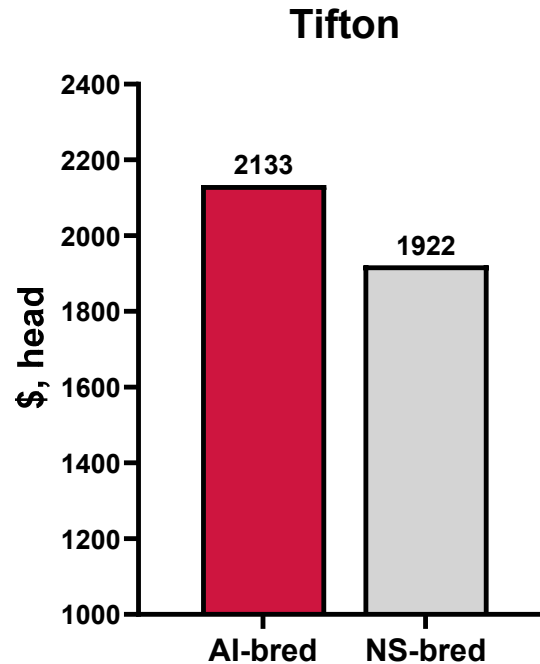


Value of artificial insemination when selling bred replacement heifers

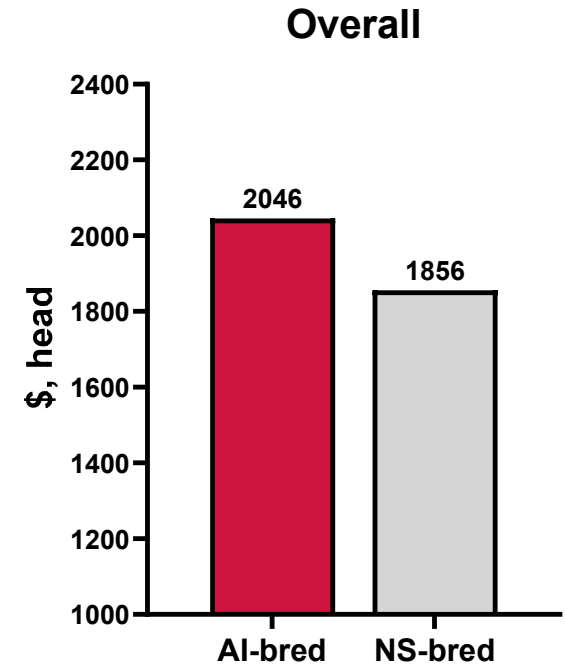
■ AI-bred ■ NS-bred



↑ \$168



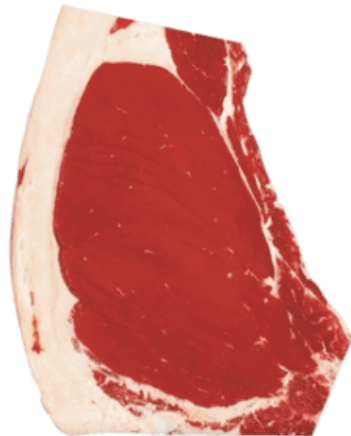
↑ \$211



↑ \$189



Carcass Value Change Based on Carcass Quality Grade



\$16.05/cwt



\$144.5

Per carcass



\$16.47/cwt



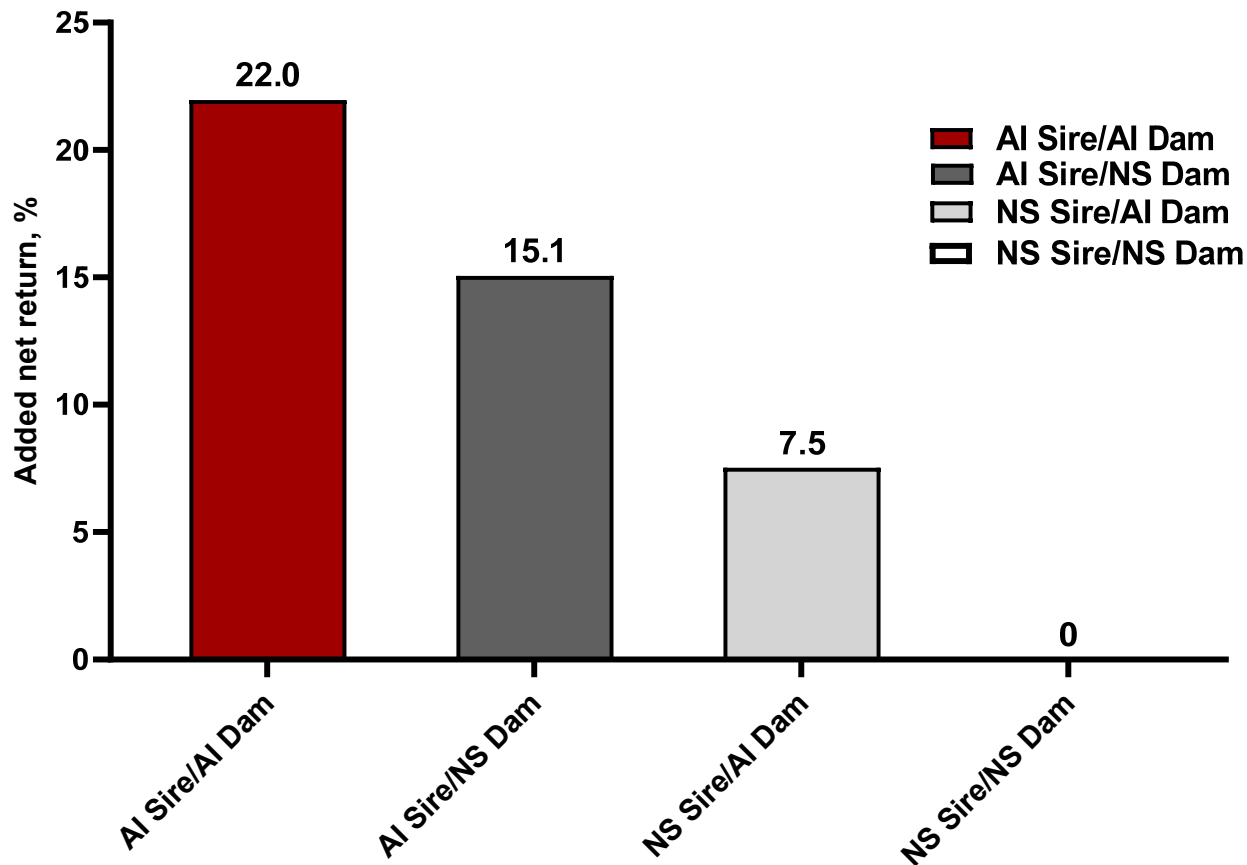
\$148.2

Per carcass



Value of artificial insemination when retaining ownership until harvest

Economic return calculate per cow exposed to the breeding season



Steer classification	% Choice
NS Sire / NS Dam	61
NS Sire / AI Dam	74
AI Sire / NS Dam	85
AI Sire / AI Dam	97



How are we adding value to by incorporating reproductive technology?

- **Genetic advantage of superior sires**
 - Genetic merit
 - Predictability
- **Change calving distribution**
 - Short term vs long term consequences
 - Impact on male offspring
 - Impact on female offspring
 - Impact cow herd fertility



Thank you!

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