



Advancing Reproductive Management

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- **\$6.25/cow** exposed for every 1% decrease in pregnancy rates
(Lamb et al., 2011)

- **Factors Affecting Fertility in Beef Females**

- Postpartum anestrus
- Suckling stimulus
- Age
- Genetics
- Nutrition
- Body weight
- Body condition score
- Reproductive management
- Plane of nutrition
- Body composition
- Animal handling

**Maximize pregnancy rate early in the
breeding season and develop/select
replacement heifers that are highly fertile
at the lowest cost possible**

Reproductive Efficiency

=

Management

+

Nutrition

+

Selection pressure

+

Reproductive technologies





Individual Identification



Accurate Records

Record Keeping

- Dam ID – sire information
- Date of birth
- Birth weight
- Weaning weight
- BCS at calving and breeding
- Health records
- Temperament
- Breeding



- **Identify your good cows**
 - Calve without assistance
 - Pregnant early
 - Maintain BCS
 - Wean a calf
 - 50% of cow's BW
 - **NOT CRAZY!**

Temperament and Fertility

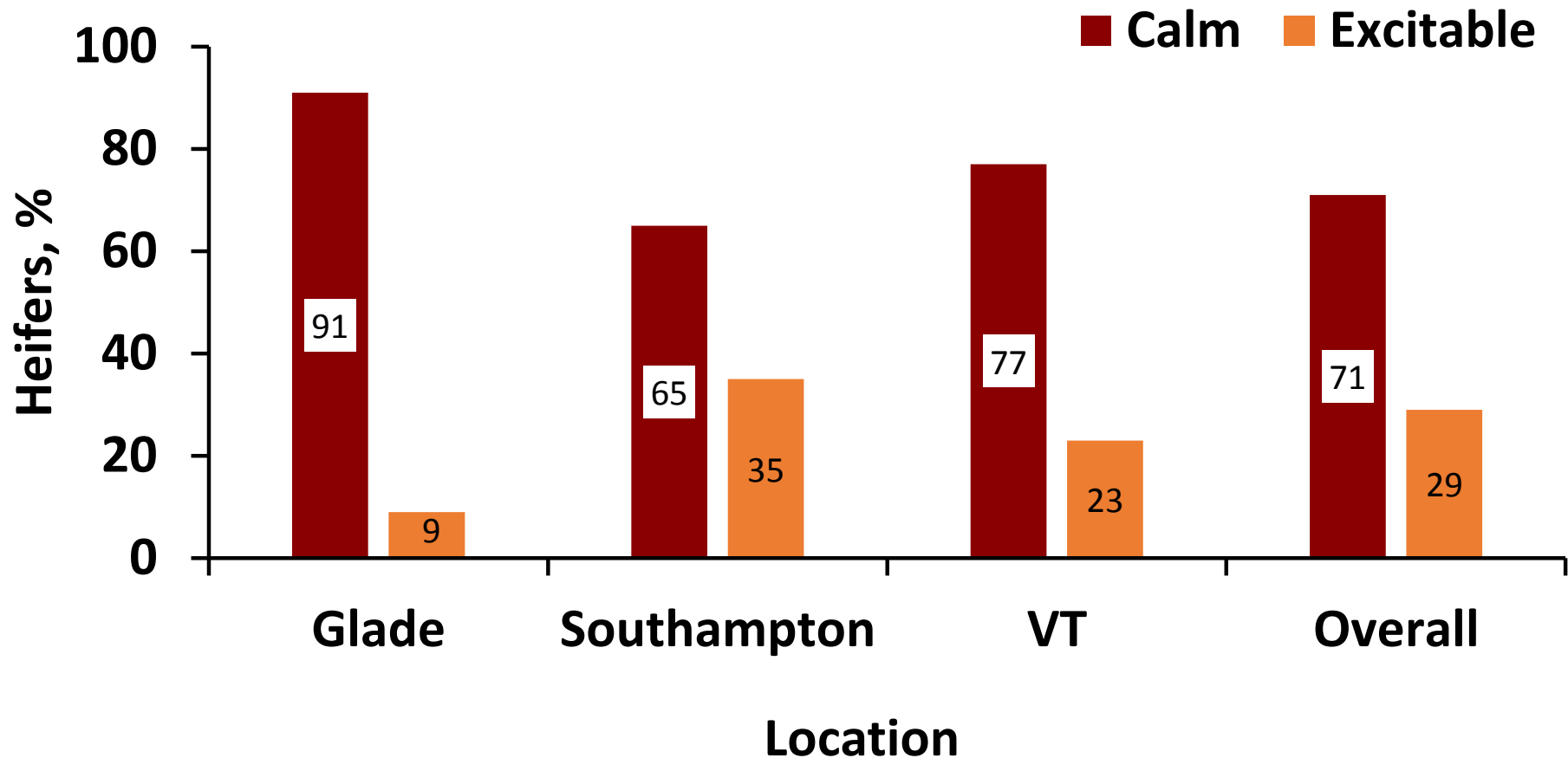
Bos taurus beef heifers in VA

Temperament Measurement				
Location	n	Chute Score	Exit Velocity	Temperament Score
1	43	2.1 ± 0.5	2.9 ± 0.5	2.5 ± 0.5
2	206	2.4 ± 0.6	2.7 ± 0.6	2.6 ± 0.5
3	48	2.8 ± 0.5	2.4 ± 0.8	2.6 ± 0.5
Overall	297	2.4 ± 0.5	2.6 ± 0.6	2.6 ± 0.5

Temperament and Fertility

Bos taurus beef heifers in VA

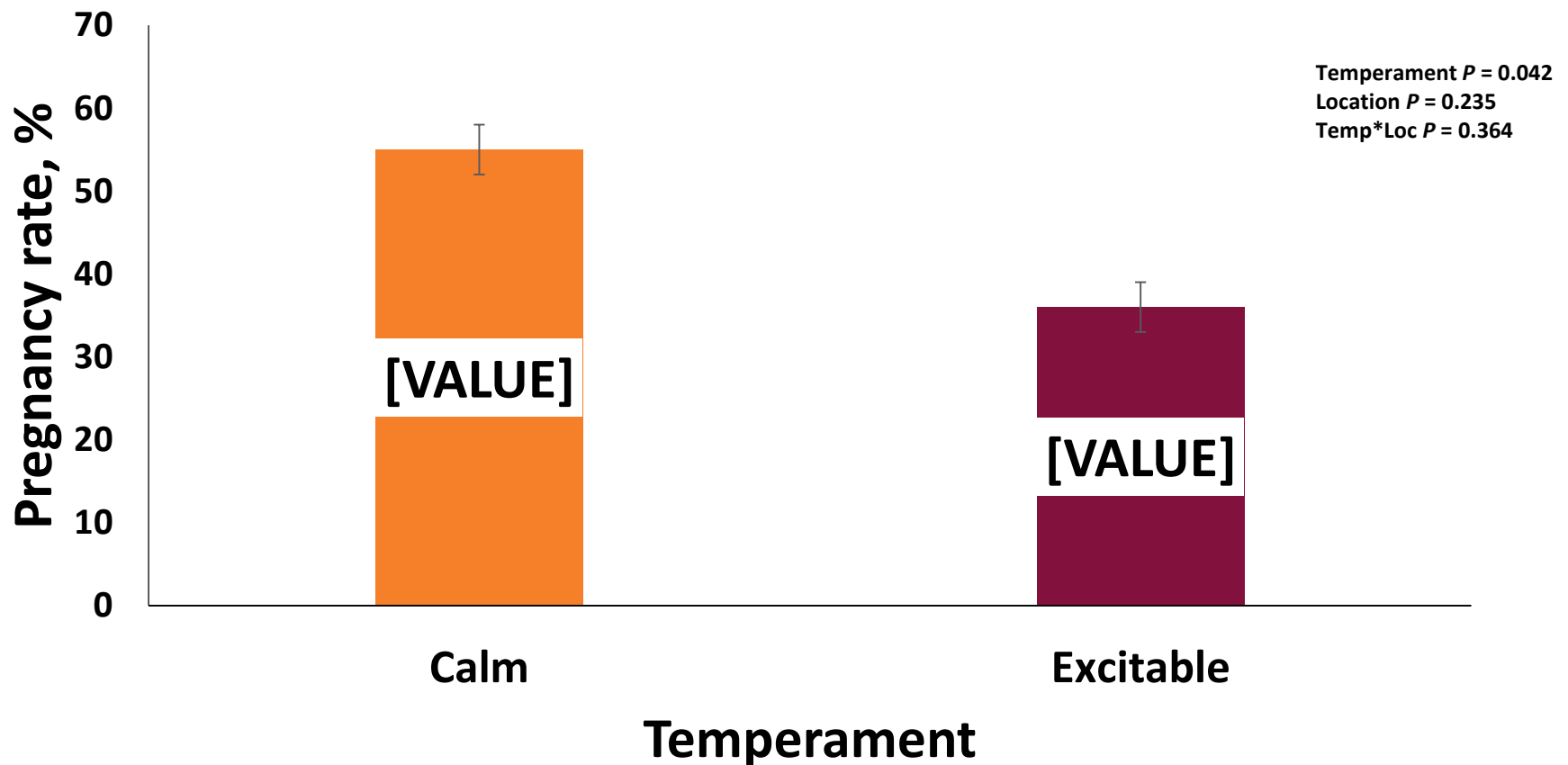
Temperament by Location



Temperament and Fertility

Bos taurus beef heifers in VA

TAI Pregnancy rate by Temperament



Bos taurus beef cows

Item	Temperament type ¹		<i>P</i> -value
	Adequate (n = 324)	Aggressive (n = 109)	
<i>Cow parameters</i> ²			
Cow BCS	4.65 ± 0.02	4.59 ± 0.04	0.17
Plasma cortisol, ng/mL	17.8 ± 0.6	22.7 ± 1.0	< 0.01
Pregnancy rate, %	94.6 ± 1.4	88.7 ± 2.4	0.03
Pregnancy loss, %	2.83 ± 0.95	3.74 ± 1.65	0.63
Calving rate, %	91.8 ± 1.6	85.0 ± 2.8	0.04
<i>Cow-calf production parameters</i> ³			
Kg of calf born per cow exposed, kg	36.8 ± 0.7	34.1 ± 1.2	0.05
Calf loss from birth to weaning, %	1.92 ± 0.70	1.06 ± 1.22	0.54
Weaning rate, %	89.9 ± 1.7	83.9 ± 3.0	0.09
Kg of calf weaned per cow exposed, kg	223 ± 4	207 ± 8	0.08

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Reproductive technologies



Body Condition Score



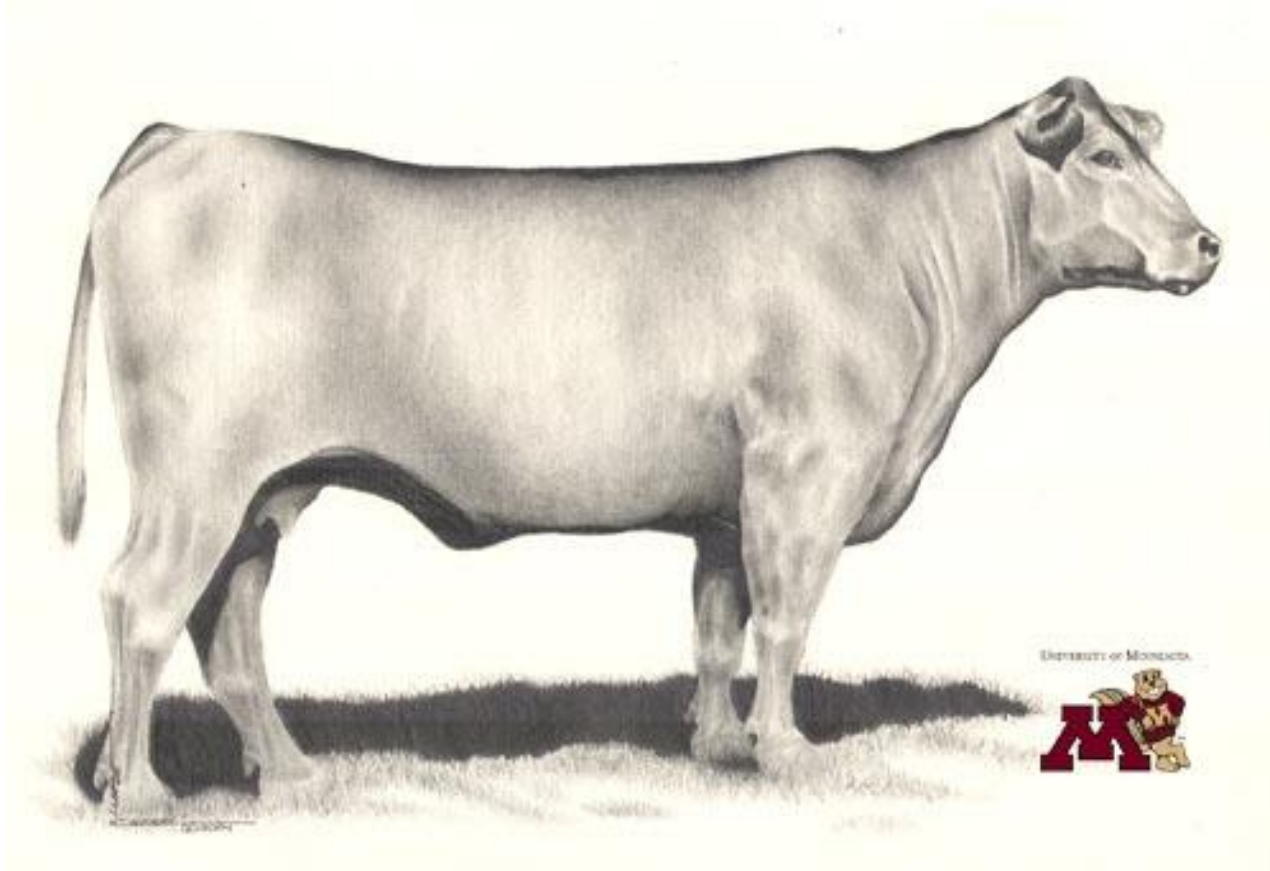
BCS 3

Body Condition Score



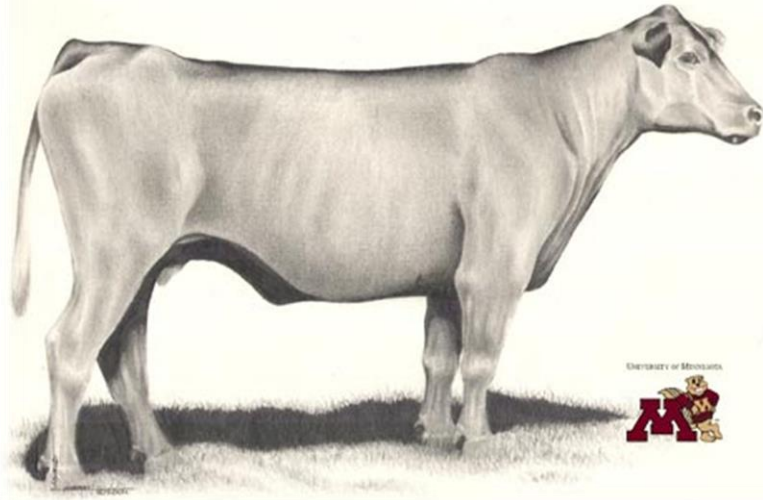
BCS 7

Body Condition Score

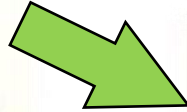


BCS 5

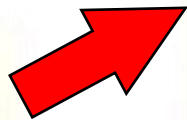
Nutrition, Nutrition, Nutrition!!



BCS 3



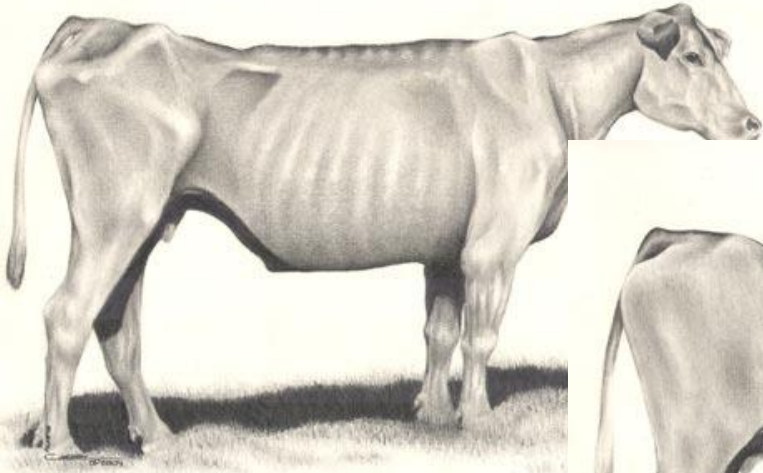
BCS 5



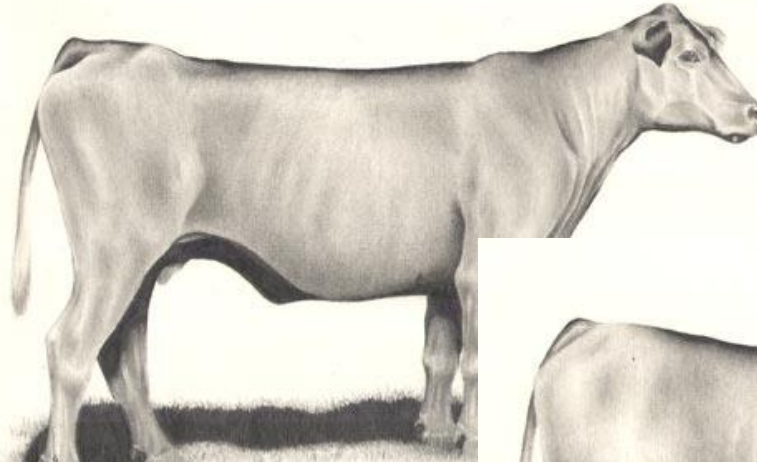
BCS 7

Nutrition

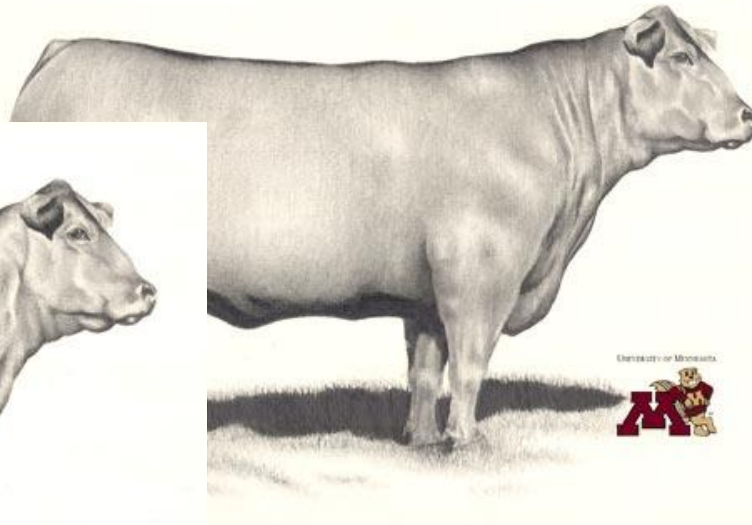
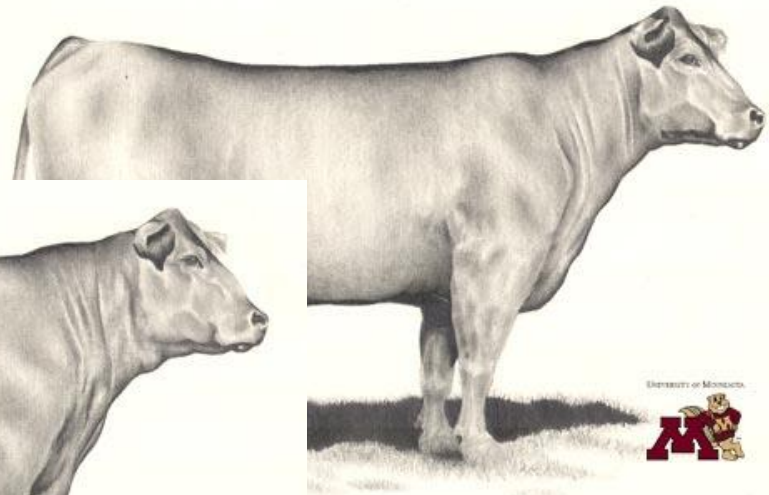
BCS 1



BCS 3



BCS 5



BCS 7



BCS 9

Reproductive Efficiency

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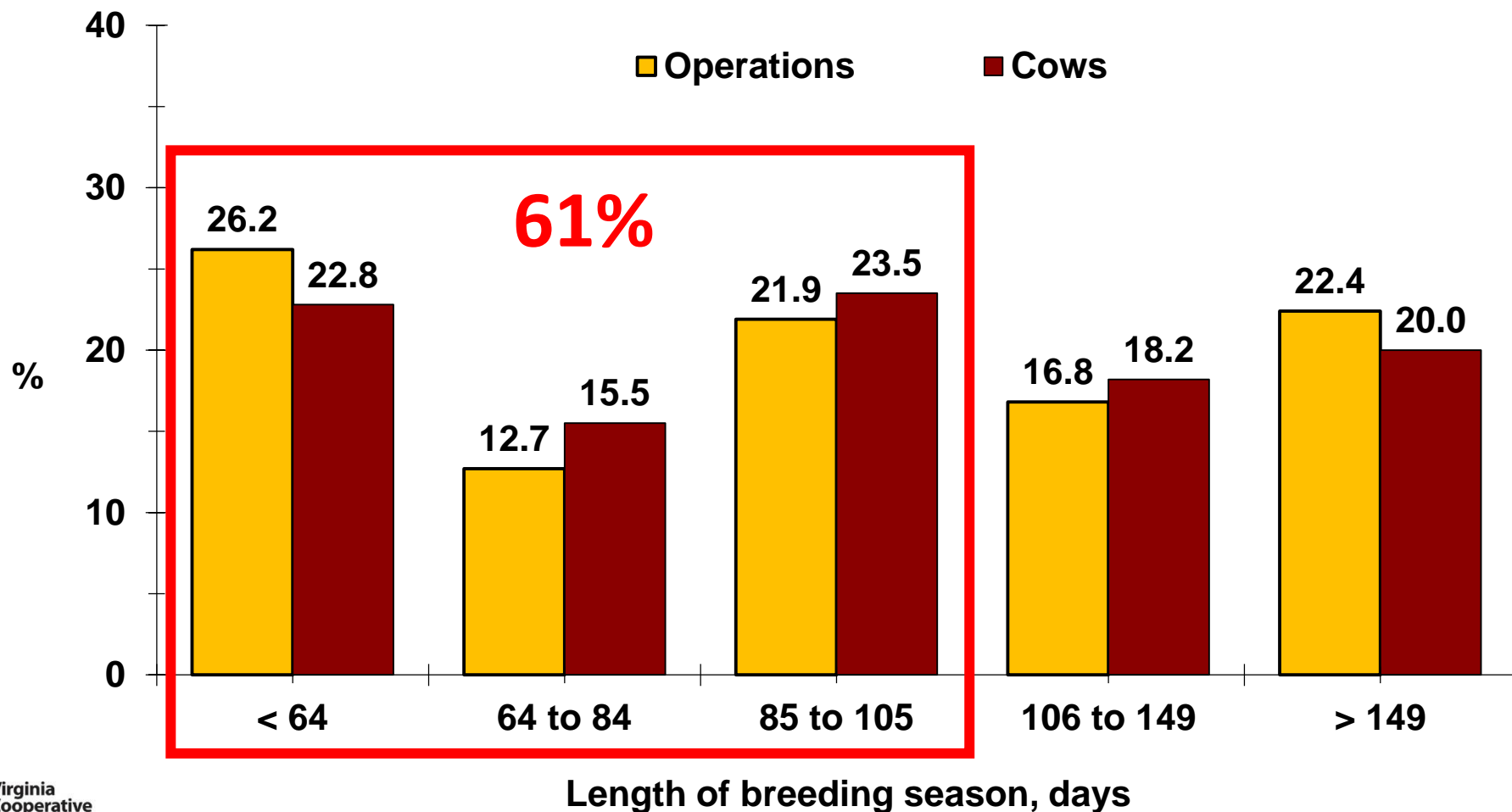


Cow and Heifer job description

- Must calve by 24 months of age
- Cow must have a calf every 365 days
- Cow must calve without assistance
- Calf must be genetically capable to perform
- Cow must provide sufficient resources for the calf to reach it's genetic potential
- Cows must maintain their body condition score for management conditions
- Must not be crazy!



- Breeding Season**



- Remove your bulls from the cows!!!
- When do you want your calves to be born?
 - Nutrition
 - Cow performance
 - Calf performance
 - Cattle Market



- 365 days is not a breeding season!
- When do you want your calves to be born?
- Establish goals
 - 45-120 days
 - 10-15 days per year decrease

Breeding Season

Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov

Calving Season

Cattle Market

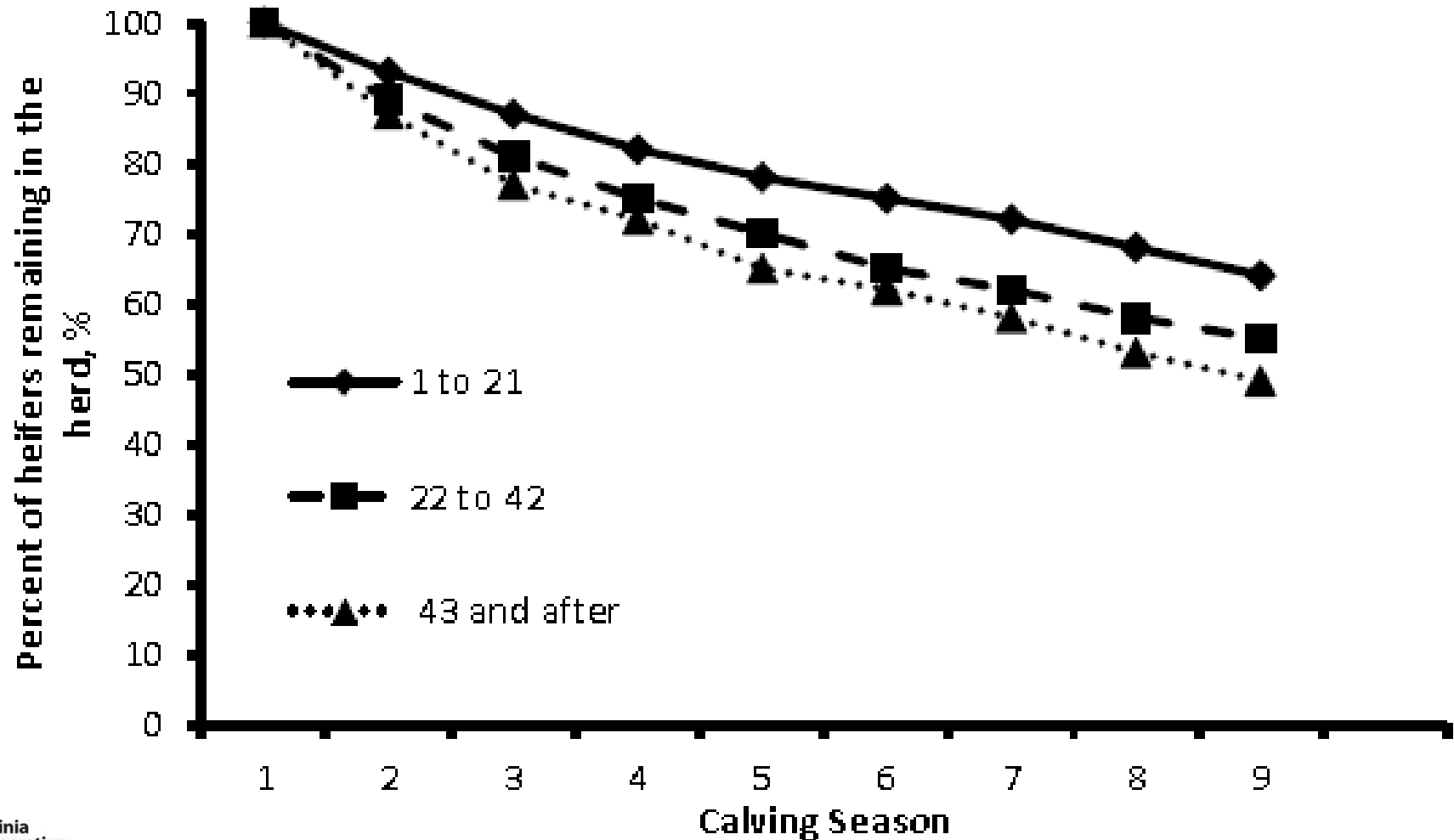
**Maximize pregnancy rate early in the
breeding season and develop/select
replacement heifers that are highly fertile
at the lowest cost possible**

- Influence of Calving Period on Weaning Weights



Selection Pressure

- Influence of Calving Period on Reproductive Longevity



Reproductive Efficiency

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Nutrition

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Selection pressure

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Reproductive technologies



Pregnancy Diagnosis

Reproductive Efficiency

=

Management

Culling Open Cows!!

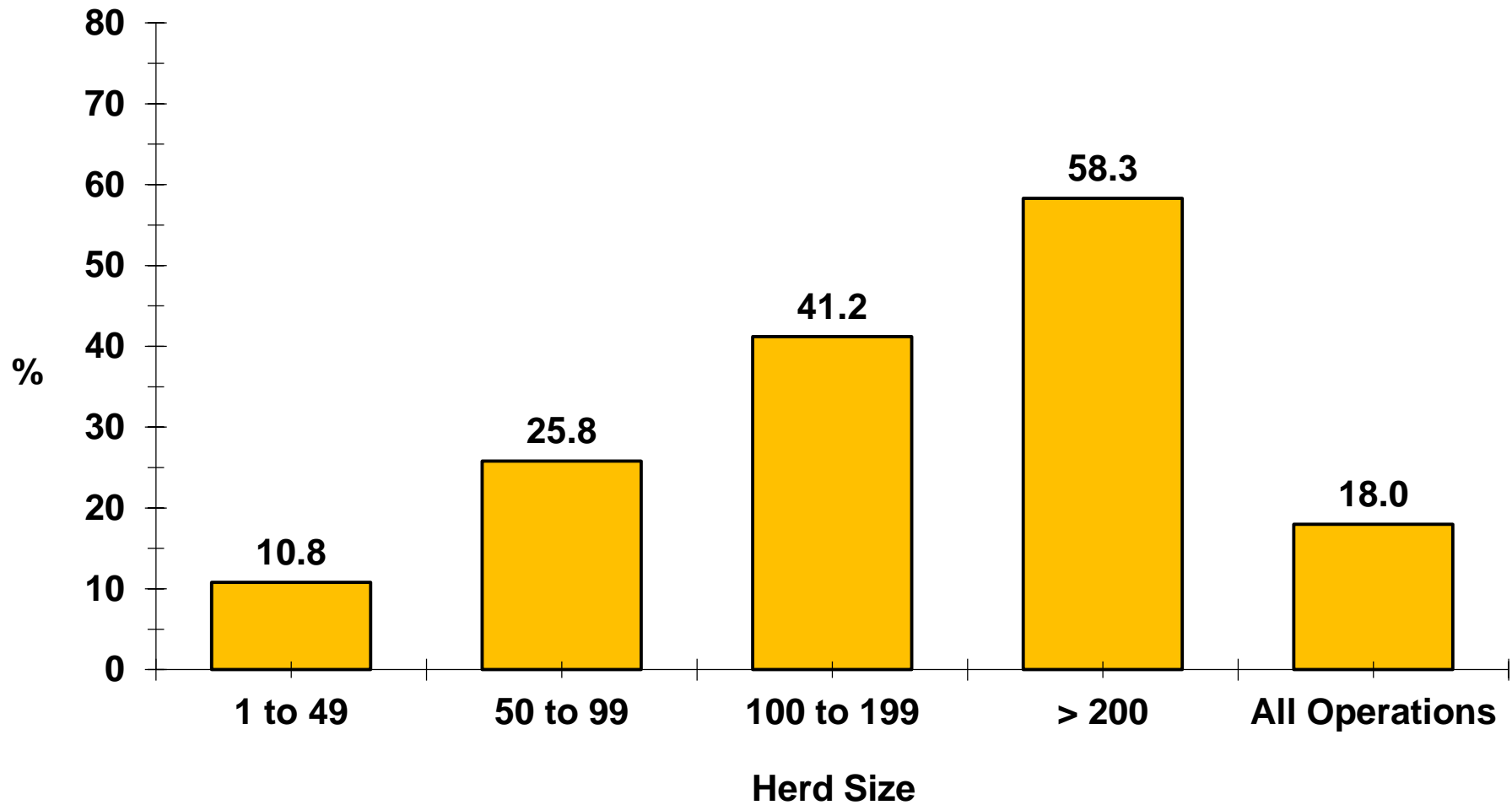
+

Selection pressure

+

Reproductive technologies

Pregnancy Diagnosis



Reproductive Efficiency

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Management

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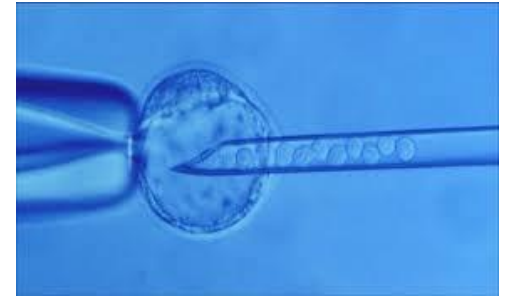
Selection pressure

+

Reproductive technologies



- Breeding season management
- Breeding soundness exam
- Pregnancy diagnosis
- Weaning
- Culling open females
- Crossbreeding
- Artificial insemination
- Estrus synchronization
- Fixed-time AI
- Embryo transfer
- *In vitro* fertilization – IVF
- Somatic cell nuclear cloning
- Transgenic technologies



Estrous Synchronization

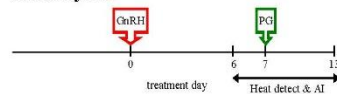
- Pharmacological control of the estrous cycle
- **Advantages of Fixed-Timed Artificial Insemination - TAI**
 - Induction of cyclicity
 - No heat detection
 - Optimization of labor
 - Increase proportion of females exposed to AI
 - More females pregnant to AI in a shorter period



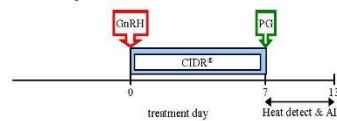
BEEF COW PROTOCOLS - 2015

HEAT DETECTION

Select Synch

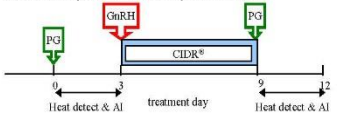


Select Synch + CIDR®



PG 6-day CIDR®

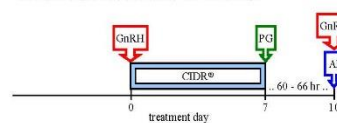
Heat detect and AI days 0 to 3. Administer CIDR to non-responders and heat detect and AI days 9 to 12. Protocol may be used in heifers.



FIXED-TIME AI (TAI)*

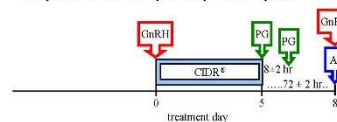
7-day CO-Synch + CIDR®

Perform TAI at 60 ± 6 hr after PG with GnRH at TAI.



5-day CO-Synch + CIDR®

Perform TAI at 72 ± 2 hr after CIDR removal with GnRH at TAI. Two injections of PG 8 ± 2 hr apart are required for this protocol.



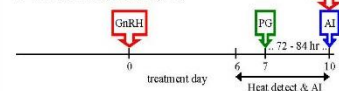
Approved 10-07-2014

Beef Reproduction Task Force

HEAT DETECT & TIME AI (TAI)

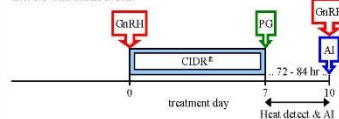
Select Synch & TAI

Heat detect and AI day 6 to 10 and TAI all non-responders 72 - 84 hr after PG with GnRH at TAI.



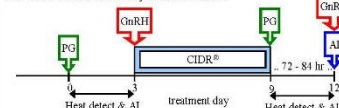
Select Synch + CIDR® & TAI

Heat detect and AI day 7 to 10 and TAI all non-responders 72 - 84 hr after PG with GnRH at TAI.



PG 6-day CIDR® & TAI

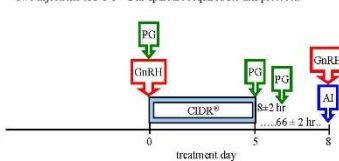
Heat detect & AI days 0 to 3. Administer CIDR to non-responders & heat detect and AI days 9 to 12. TAI non-responders 72 - 84 hr after CIDR removal with GnRH at AI. Protocol may be used in heifers.



FIXED-TIME AI (TAI)* for *Bos Indicus* cows only

PG 5-day CO-Synch + CIDR®

Perform TAI at 66 ± 2 hr after CIDR removal with GnRH at TAI. Two injections of PG 8 ± 2 hr apart are required for this protocol.



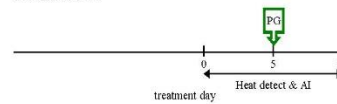
* The time listed for "Fixed-time AI" should be considered as the approximate average time of insemination. This should be based on the number of cows to inseminate, labor, and facilities.

GnRH Cystorelin®, Factrel®, Fertagyl®, OvaCyst®
PG estroPLAN®, Estrumate®, In-Synch®, Lutalyse®, ProstaMate®

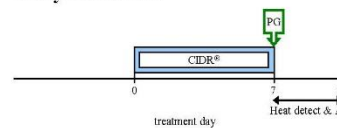
BEEF HEIFER PROTOCOLS - 2015

HEAT DETECTION

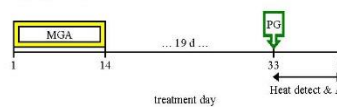
1 Shot PG



7-day CIDR®-PG



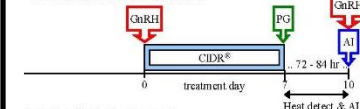
MGA®-PG



HEAT DETECT & TIME AI (TAI)

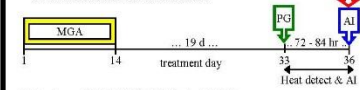
Select Synch + CIDR® & TAI

Heat detect and AI day 7 to 10 and TAI all non-responders 72 - 84 hr after PG with GnRH at TAI.



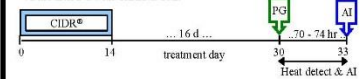
MGA®-PG & TAI

Heat detect and AI day 33 to 36 and TAI all non-responders 72 - 84 hrs after PG with GnRH at TAI.



14-day CIDR®-PG & TAI

Heat detect and AI day 30 to 33 and TAI all non-responders 72 hrs after PG with GnRH at TAI.

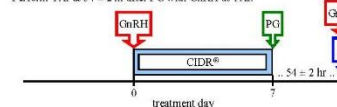


FIXED-TIME AI (TAI)*

Short-term Protocols

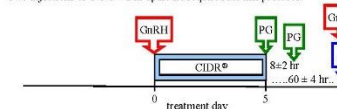
7-day CO-Synch + CIDR®

Perform TAI at 54 ± 2 hr after PG with GnRH at TAI.



5-day CO-Synch + CIDR®

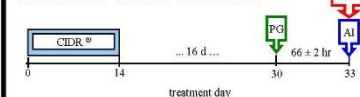
Perform TAI at 60 ± 4 hr after CIDR removal with GnRH at TAI. Two injections of PG 8 ± 2 hr apart are required for this protocol.



Long-term Protocols

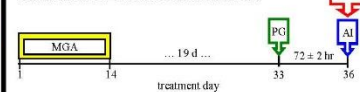
14-day CIDR®-PG

Perform TAI at 66 ± 2 hr after PG with GnRH at TAI.



MGA®-PG

Perform TAI at 72 ± 2 hr after PG with GnRH at TAI.



* The times listed for "Fixed-time AI" should be considered as the approximate average time of insemination. This should be based on the number of heifers to inseminate, labor, and facilities.

GnRH Cystorelin®, Factrel®, Fertagyl®, OvaCyst®
PG estroPLAN®, Estrumate®, In-Synch®, Lutalyse®, ProstaMate®

Approved 10-07-2014

Beef Reproduction Task Force

www.beefrepro.unl.edu

Why folks choose not to TAI?

“Too many hassle factors...”

“PREGNANCY RATES TO TAI ARE TOO LOW...”

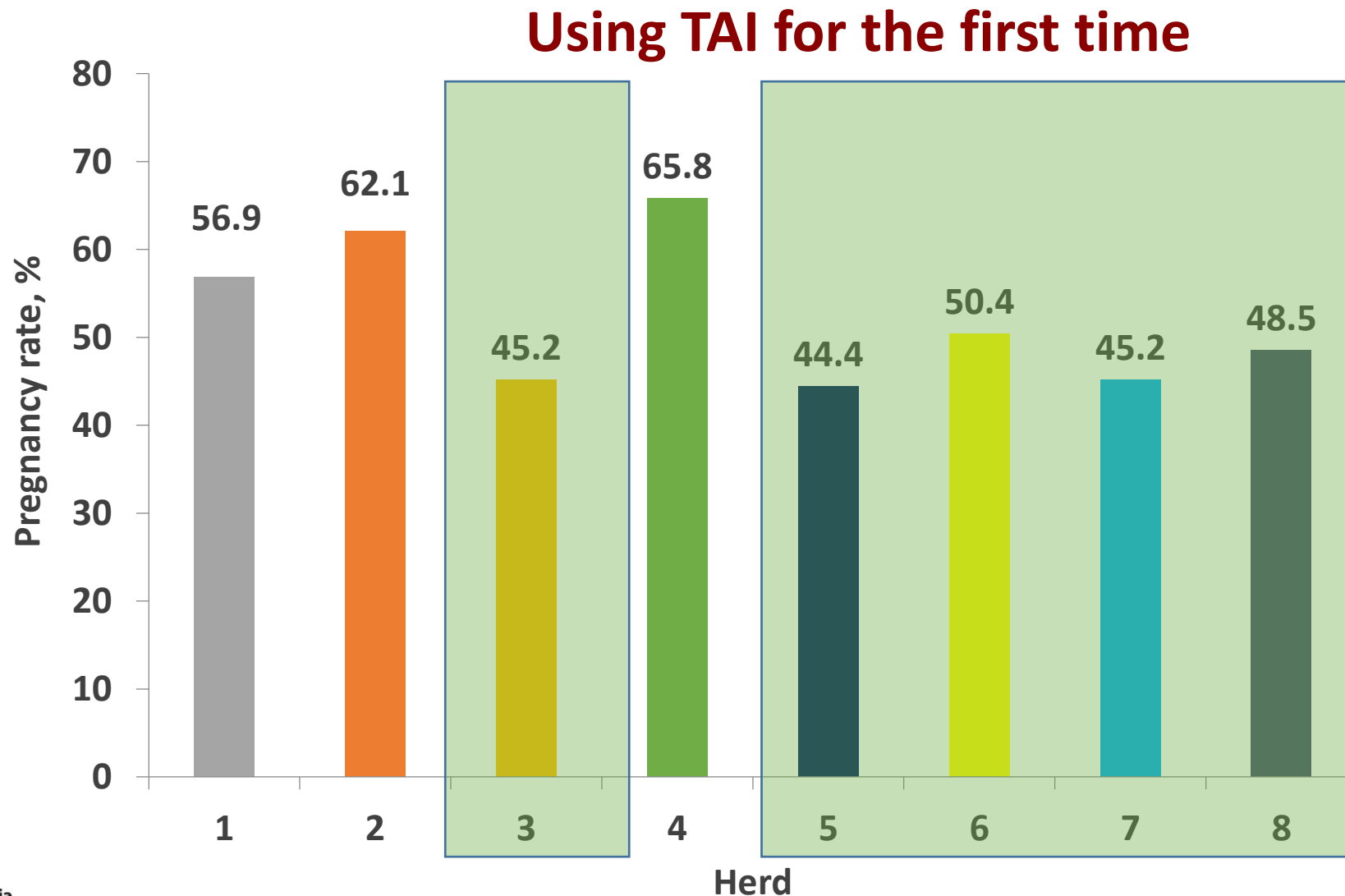
- 40-60% pregnancy rates to TAI
- It is a process that will take time and commitment!

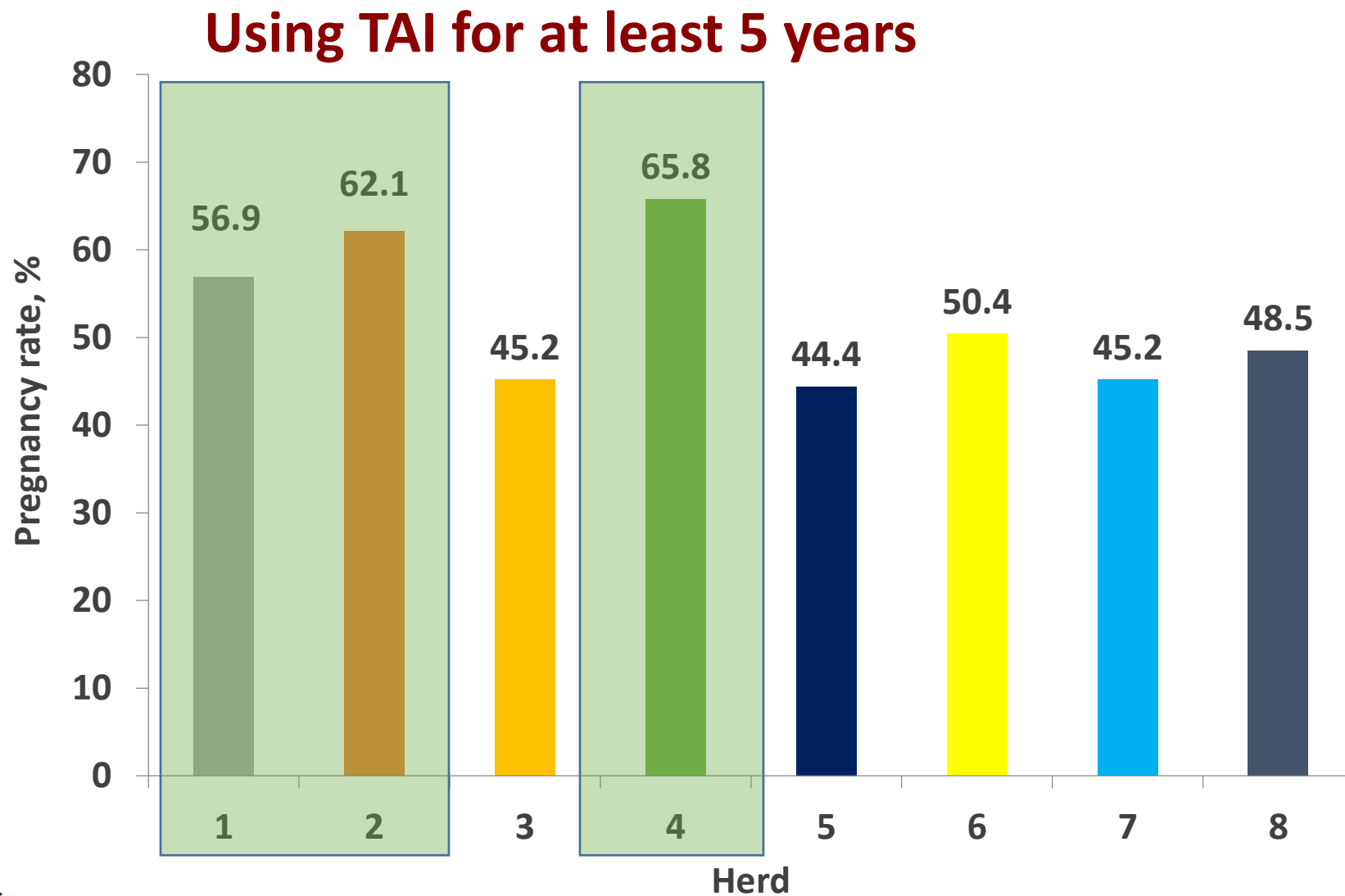
TAI in South Dakota



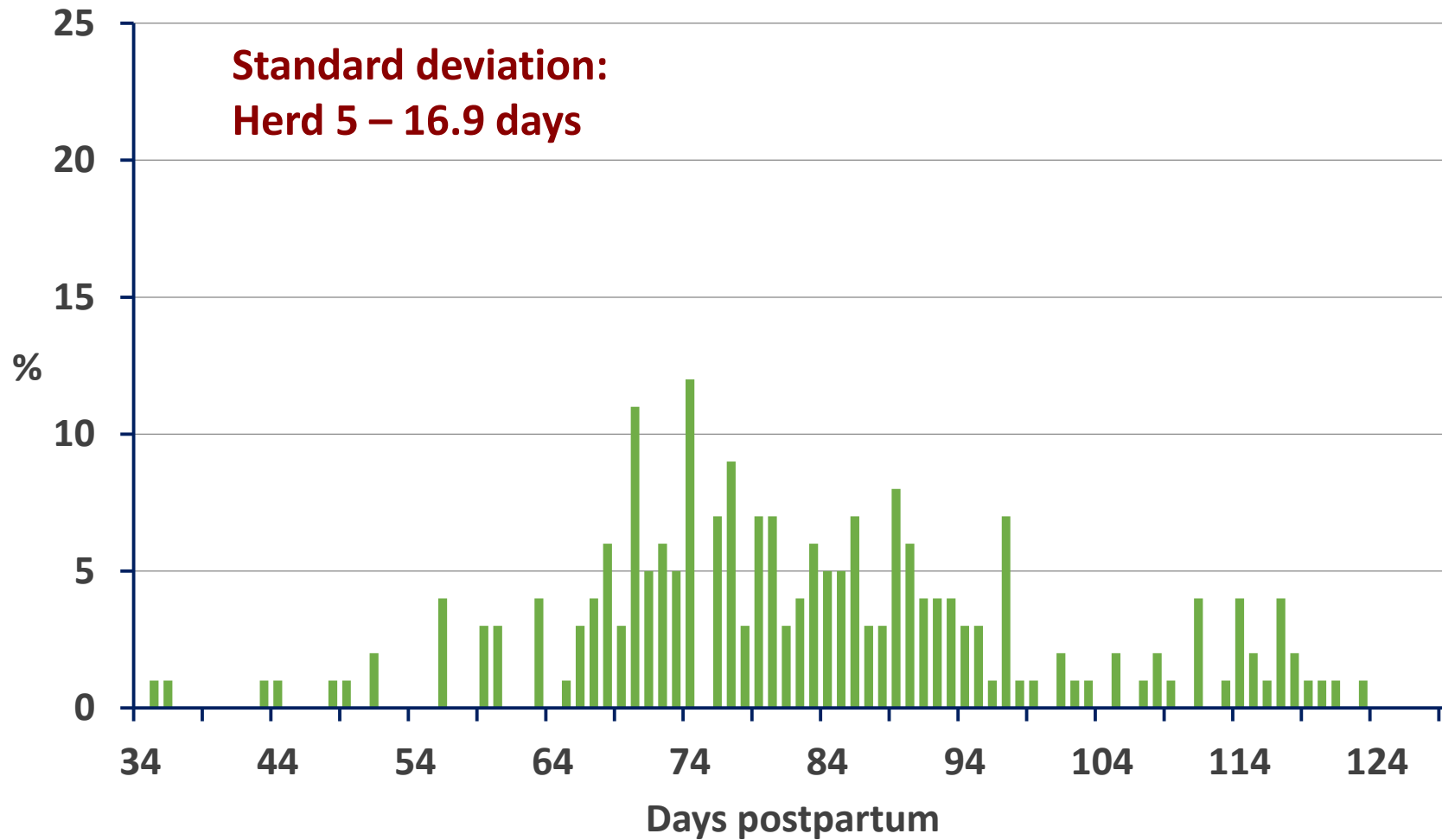
- 1,700 cows on 8 operations

TAI Pregnancy Rates by Herd

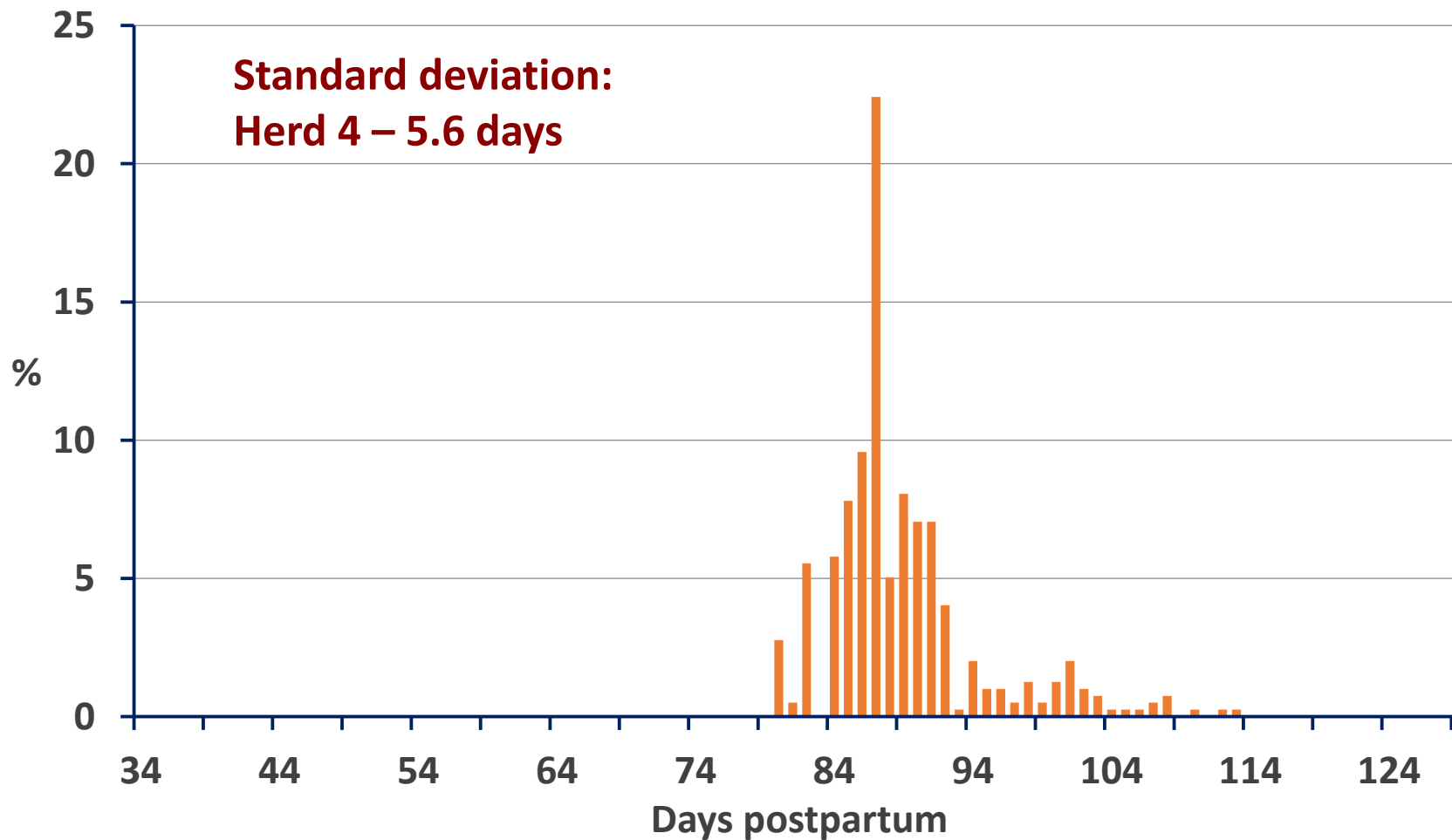




- **HERD 5 – 44.4% PR, TAI FOR THE FIRST TIME**



- **HERD 4 – 65.8% PR, TAI FOR 7 YEARS**



The benefits of TAI go beyond
genetic improvement!



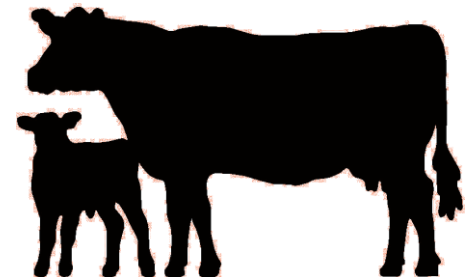
UF-NFREC CASE STUDY



UF-NFREC CASE STUDY

Cow and Heifer job description

- Must calve by 24 months of age
- Cow must have a calf every 365 days
- Cow must calve without assistance
- Cow must provide sufficient resources for the calf to reach it's genetic potential
- Calf must be genetically capable to perform
- Cows must maintain their body condition score for NFREC conditions
- Must not be crazy (disposition)



UF-NFREC CASE STUDY

2006

Start breeding
season

Remove
bulls



1

120

2007

Start breeding
season

Remove
bulls



1

120

2008

TAI heifers

TAI cows

TAI late
calving cows

TAI late, late
calving cows

Remove
bulls



1

8

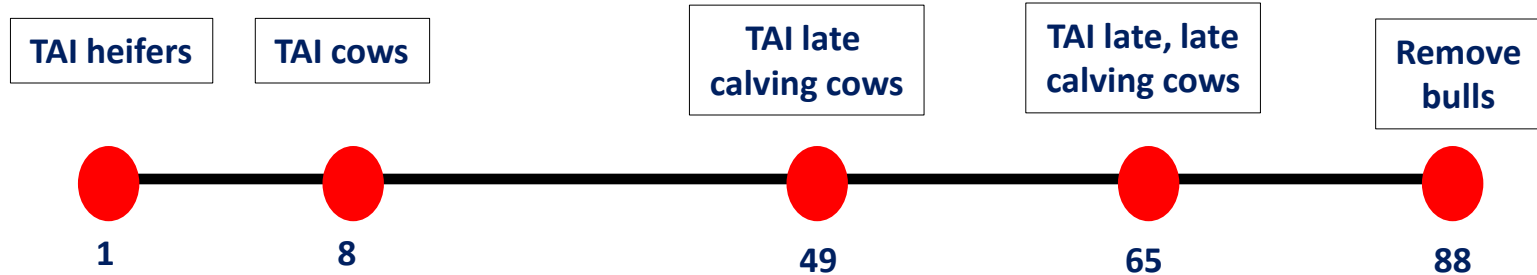
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70

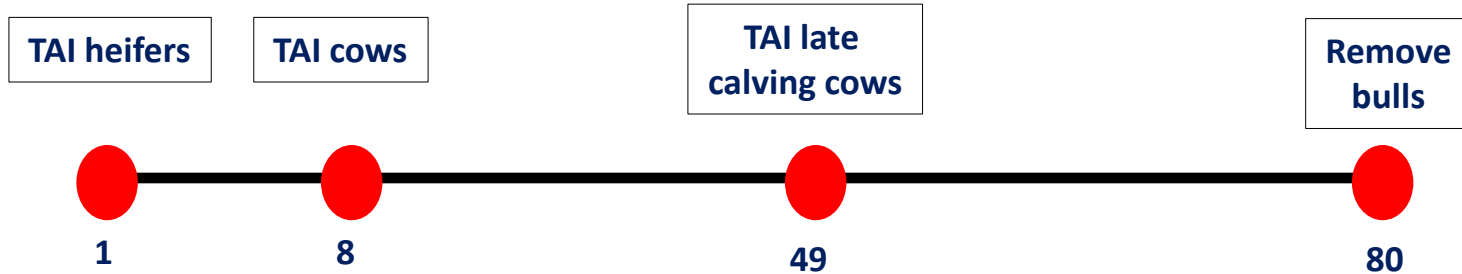
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UF-NFREC CASE STUDY

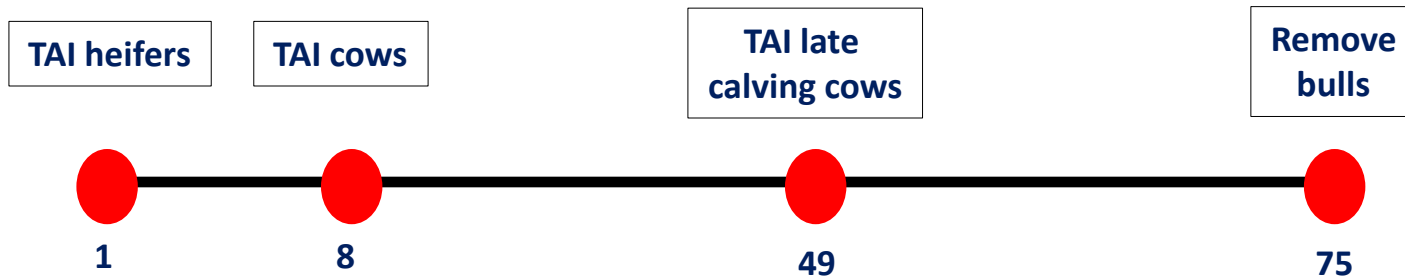
2009



2010



2011



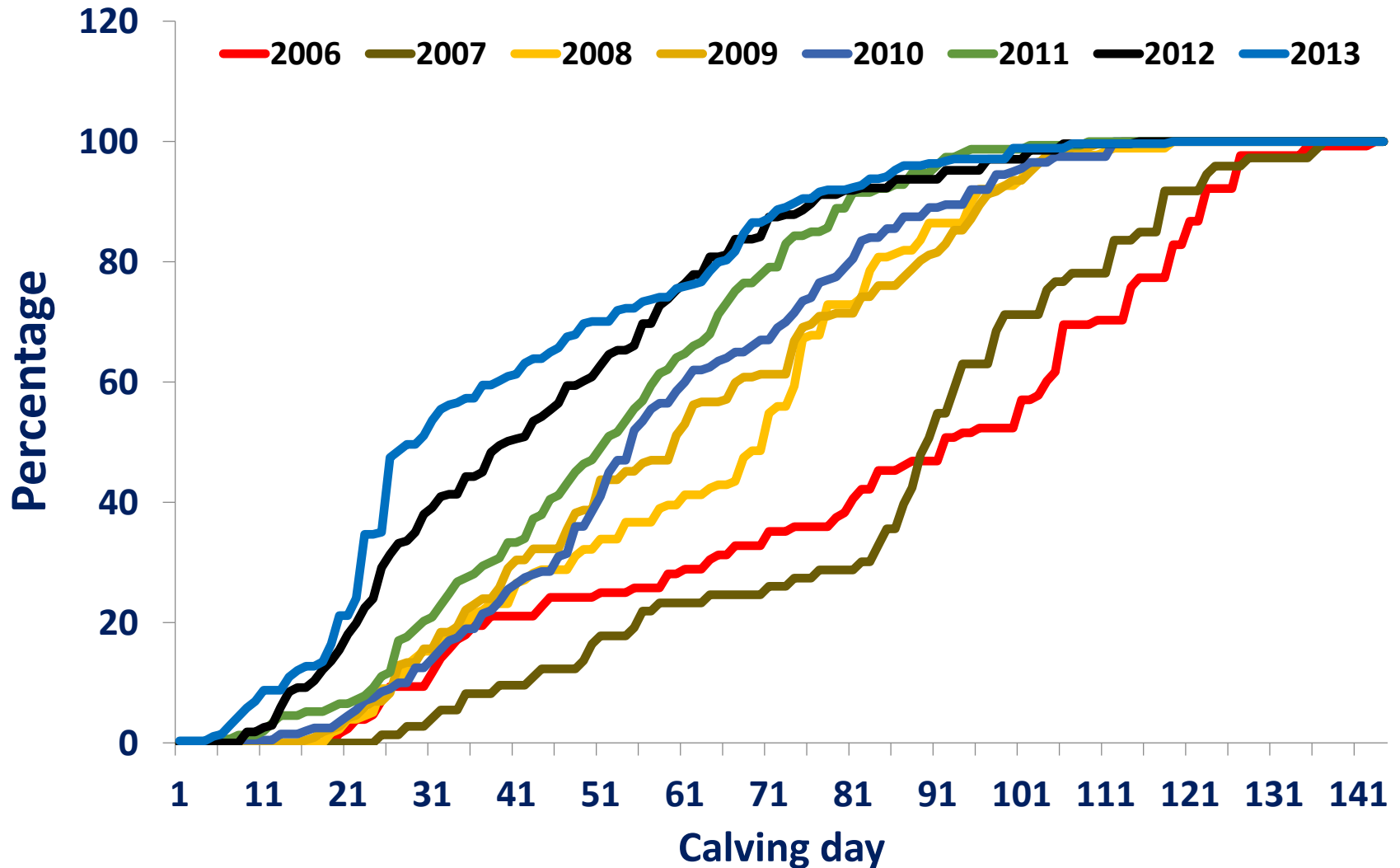
UF-NFREC CASE STUDY

2012



2013





UF-NFREC CASE STUDY

Breeding season pregnancy rates:

Year	2006	2007	2008	2009	2010	2011	2012	2013
Breeding season length	120	120	110	88	80	75	70	72
Pregnancy rates	81%	86%	84%	86%	82%	94%	92%	93%
Mean calving day	79.2	80.9	59.2	56.2	53.7	47.2	39.5	38.7

UF-NFREC CASE STUDY

Change in calf value:

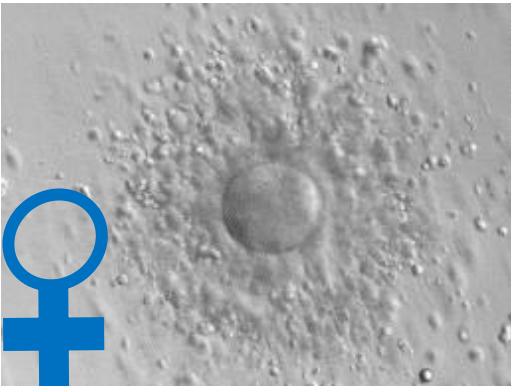
Year	2006	2007	2008	2009	2010	2011	2012	2013
Mean calving day	79.2	80.9	59.2	56.2	53.7	47.2	39.5	38.7
Difference from 2006/2007	0	0	21.7	24.7	27.2	33.7	41.4	42.2
Per calf increase in value	0	0	\$65	\$74	\$82	\$101	\$124	\$127
Herd increase in value	0	0	\$19,530	\$22,230	\$24,480	\$30,330	\$37,260	\$37,980

Recipe for a calf



+

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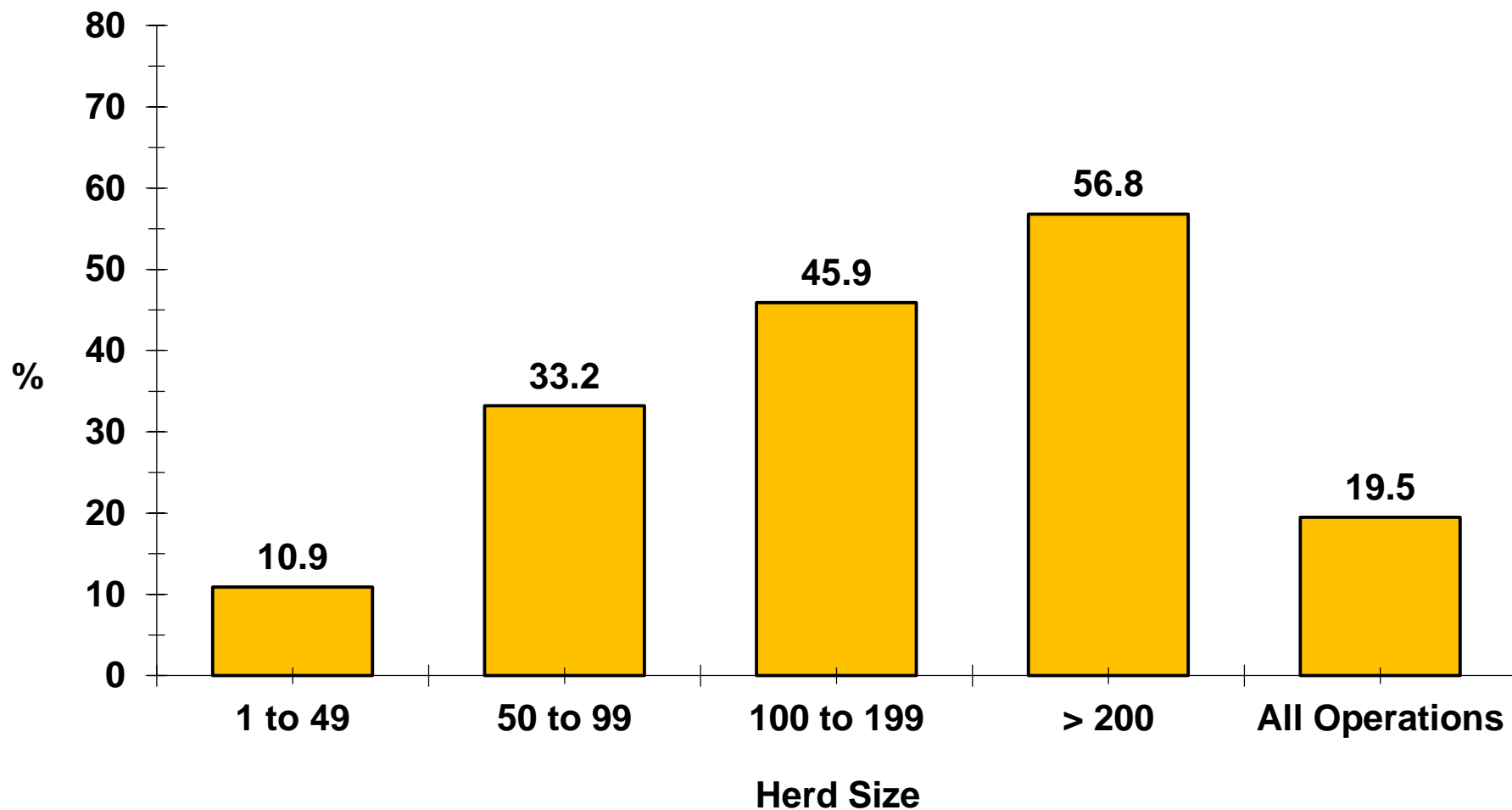
Essential Attributes for Fertility

- Physical capability to mate
- Capacity to produce spermatozoa / semen
- Functionally normal spermatozoa

Breeding Soundness Exam - BSE

- Willingness and eagerness to mate – LIBIDO

Breeding Soundness Exam



Reproductive Efficiency

=

Management

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Nutrition

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Selection pressure

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Reproductive technologies



YOU DECIDE WHEN YOUR COWS GET PREGNANT!!

- Maximize cows exposed to AI
- Maximize pregnancy rate
- More cows pregnant earlier
- More calves born earlier
- Heavier weaning weights



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