


## Management of Young Cows for Maximum Reproductive Performance



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## Troublemaker!



Why?

- Won't rebreed

Why?

- Long postpartum anestrus interval

Why?

- Insufficient energy to reproduce

Why?


## Overview of Presentation

- Why?
  - New problem?
  - Bigger problem?
- Solutions?



## Mature Cow Size?

“My cows weigh ~ 1200 pounds”  
...is as big a lie as...


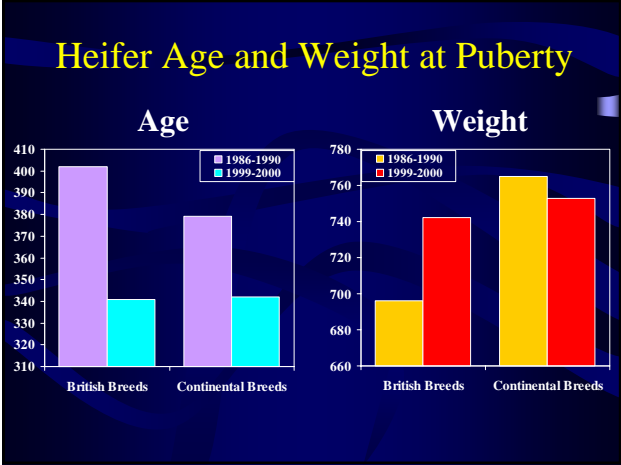


## Mature Cow Size?

“My cows weigh ~ 1200 pounds”  
...is as big a lie as...

“I'll love you just as much in the morning!”

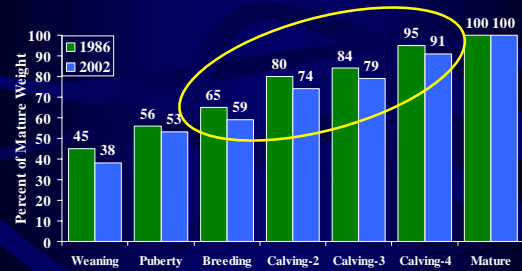
Roy Wallace  
Select Sires

## Heifer Development: Feeding to a "Target Weight"

Item	% of Mature Wt @ breeding	
	55%	65%
Pre-breeding wt	600	683
Conception (21d)	30	62
Calving wt.	834	897
Calf birth wt.	71	73
Calving difficulty,%	52	29
Calf death loss,%	6	5

## Beef Heifer/Cow Growth



## New Factors Affecting Rebreeding Performance of Young Cows

1. ↑ Mature cow size
2. ↓ Age / Weight at breeding
3. ↓ Percent of mature weight at 1<sup>st</sup> calving
4. ↑ Selection for milk has increased
5. ↓ Heterosis

## Measures of Fertility

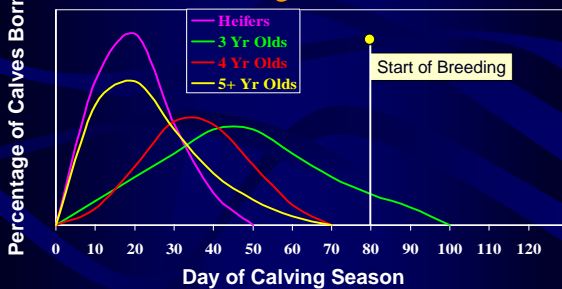
### Cow/Heifer

- Pregnancy rate – percentage of cows that became pregnant out of those that were exposed to breeding.
- Culling Tool

Why didn't that cow/heifer become pregnant?

## Measures of Fertility

### Calving Distribution



## Measures of Fertility

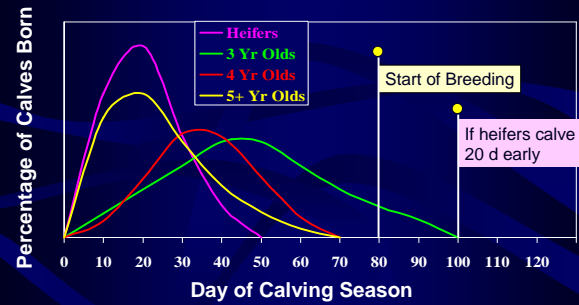
- Conception rate – percentage of cows that became pregnant out of those that were actually bred.
- Fertilization occurs > 95% of time.
- Embryo death occurs 20 – 40% of time.
- Postpartum interval (PPI) – interval from calving to re-initiation of estrous cycles.

## Effect of Cow Age on PPI

Age of Cow	Days after calving						
	40	50	60	70	80	90	100
	<u>% Cycling</u>						
5 or older	55	70	80	90	90	95	100
2-3 years	15	30	40	65	80	80	90

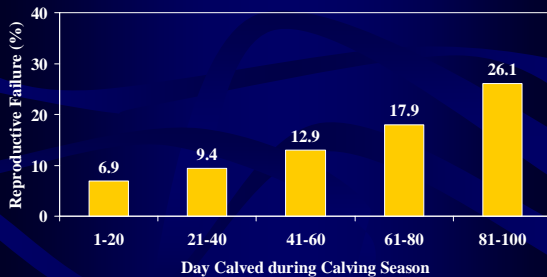
✓ Increase the percentage of young cows that calve early in the calving season

## Calving Distribution



✓ Calving heifers ahead of cowherd won't solve all problems

## Effect of Calving Day during Calving Season on Subsequent Reproductive Performance



✓ Heifer calving season has to be short

## Conception Rate by Days Postpartum

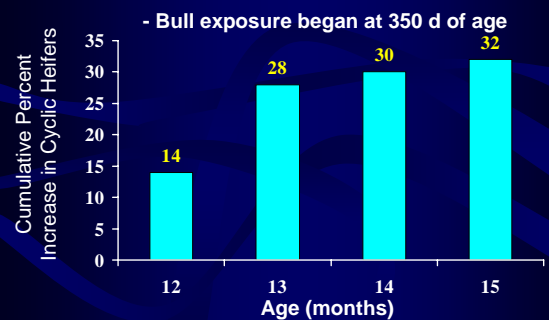
Days Postpartum	Conception Rate
0-30	33%
31-60	58%
61-90	69%
91-120	74%

✓ Embryonic death decreases as PPI increases.

## Goal: Short Heifer Calving Season

- Develop heifers to be 65% of mature weight at breeding.
  - Select replacements from older calves.
  - Identify target weight and feed accordingly.
- Utilize a short breeding season.
  - Induce estrous cycles.
  - Synchronize estrous cycles.
- Fetal aging at pregnancy diagnosis.

## Reproductive Management Practices - Bull Exposure

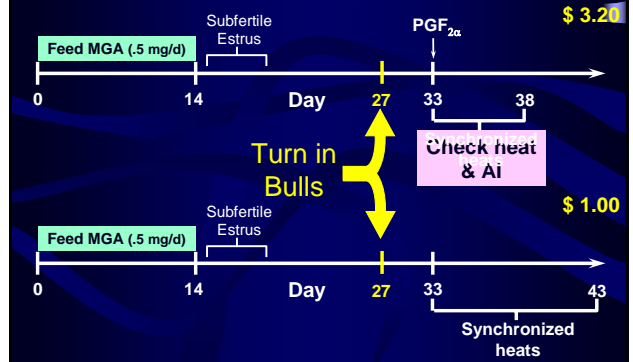


✓ 15 to 45 days of bull exposure may be sufficient

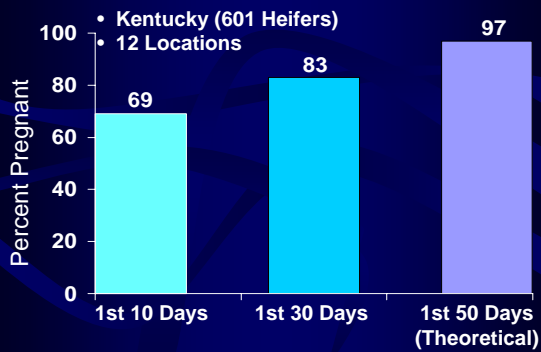
## Effect of Bull Exposure on Puberty and Fertility of Yearling Heifers

Group	Age at puberty, d	Pregnant at	
		21 days	50 days
Exposed	399	51	86
Non-exposed	439	17	81
<b>Difference</b>	<b>40</b>	<b>34</b>	<b>5</b>

## Estrous Synchronization with AI or Natural Service for Heifers



## Estrous Synchronization & Bulls



## Calving Assistance:

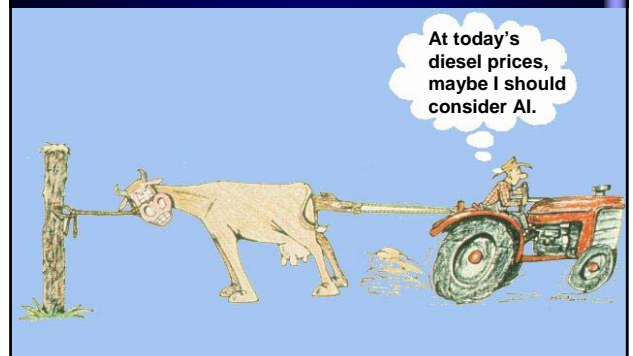


## Calving Assistance

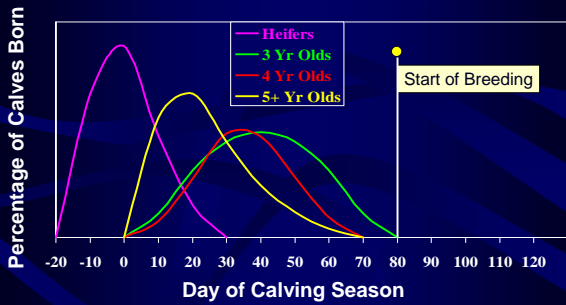
Item	Stage II Labor	
	Late	Early
PPI	51	49
% in heat	82	91*
Services/conception	1.24	1.15
Fall Pregnancy	78	92*
Calf Vigor	1.1	1.2
Calf ADG	1.63	1.74*
Calf WW	387	422*

After 1.5 h of stage II labor, every 30 min. delay in assistance results in a 6 day longer interval to pregnancy!!!

## Breed Heifers AI to "Calving Ease" Proven Sires



## Calving Distribution



✓ Calving heifers ahead of cowherd and in a short calving season won't solve all problems

## Nutrient Partitioning in the Beef Cow

1. Basal Metabolism
2. Activity
3. Growth
4. Basic Energy Reserves
5. Pregnancy Maintenance
6. Lactation
7. Additional Energy Reserves
8. Estrous Cycles and Pregnancy Initiation
9. Excess Reserves

## Improve Energy Availability for Reproduction

BCS @ Calving	Postpartum Interval	Pregnancy % (90d)
3	89	---
4	70	50
5	60	81
6	52	88
7	31	90

✓ Sort cows by BCS (or age) for winter feeding

## Temporary Calf Removal Improves Reproductive Performance

Treatment	After 21d Breeding	
	Heat	Pregnant
Control	31%	17%
48-hr Calf Removal	62%	44%
Difference	31%	27%

- ✓ Provide calves dry environment with clean grass hay and water.
- ✓ Pair up before returning to pasture.

## Improve Energy Utilization with Ionophores

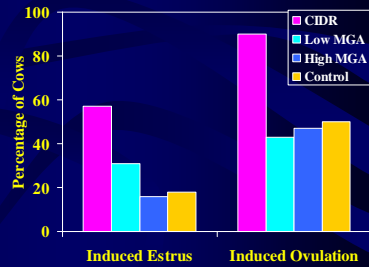
Study	Postpartum Interval (days)		
	Ionophore	Control	Difference
1	30	42	12
2	59	69	10
3	67	72	5
4	65	86	21
5	92	138	46
Cost: \$ .014/d		Mean	18 days

## Bull Exposure for Postpartum Cows?

- Decreases PPI by ~ 15 days.
  - Bull exposure began 0 - 4 weeks after calving for 30 days or until the start of breeding.
  - Bull:Cow ratio of 1:20.
- Exposure to androgenized cows produces the same results.

## Hormonal Induction of Estrous Cycles

- GnRH
  - Select Synch
  - 7-11 Synch
- Progestins
  - All progestins are not equal



## Early & Permanent Weaning

- Decreases energy and protein demand by 30%.
- How early?
  - 30 to 150 days



## How early to "Early Wean?"

- Goal: Improve reproductive performance?
  - Early weaning at 30 to 60 days of age.
  - Greatest response among 1<sup>st</sup> calf heifers.

### Nebraska Study:

Early weaning 8 days before the start of a 42 day breeding season

Early versus normal weaning	2 Yr Olds	3 Yr Olds	Mature Cows
Increased percent in estrus	29%	27%	16%
Increased pregnancy rate	26%	16%	8%

### Clemson Study:

	Early weaned (56 d)	Normal weaned
Heifers calving within first 30 days	81%	46%

## Reproductive Benefits: Early Weaning

### Oklahoma Study:

Early weaning (~ 50 days) in Hereford heifers or mature cows

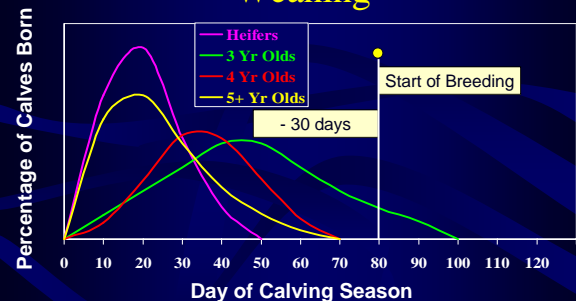
	1st Calf Heifers		Mature Cows	
	Normal Weaned	Early Weaned	Normal Weaned	Early Weaned
Weight, lbs				
at early weaning	698	680	816	832
at end of breeding	746	753	922	968
at normal weaning	788	875	920	1040
Conception Rate, %	59	97	83	100
Calving to first estrus, days	91	73	81	46

- ✓ Early weaned calves were 88 lbs heavier than normal weaned calves at the time of normal weaning!!!

## Cost Benefits: Early Weaning

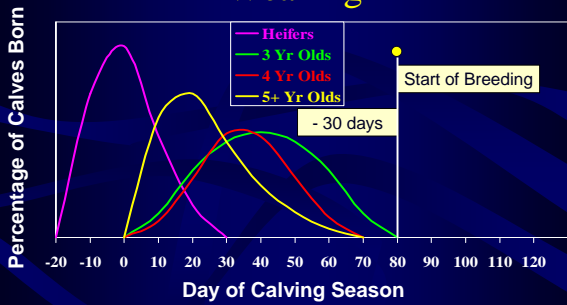
Calf Diet Cost (50 to 205 d of age)	-\$75.00
Calf 205 d wt (+ 60 lbs @ \$.95)	\$57.00
Cow feed savings (+ 1 to 1.5 BCS)	\$65 - 100 +\$47 - 82
Reproductive performance (+ 8 to 38% pregnancy rate) (earlier pregnancies)	???

## Practical Considerations to Early Weaning



- ✓ Only cows that calved at least 30 days before breeding are candidates for early weaning.

## Practical Considerations to Early Weaning



✓ Heifers are ideal candidates for early weaning.

## Optimize Rebreeding Performance of Young Cows

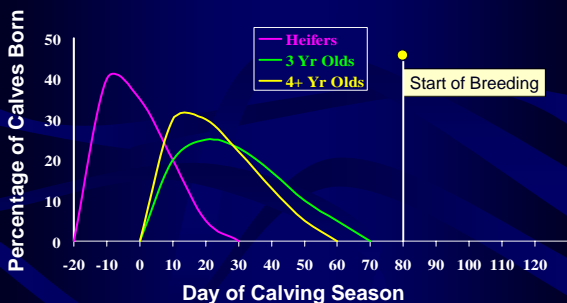
- Identify problem females.
- Manage heifers to calve early in a short calving season.
  - Develop to 65% of mature weight at breeding.
  - Induce estrous cycles.
  - Synchronize estrus in heifers.
  - AI heifers to calving ease proven sires.
  - Earlier pregnancy diagnosis & fetal aging.

## Optimize Rebreeding Performance of Young Cows

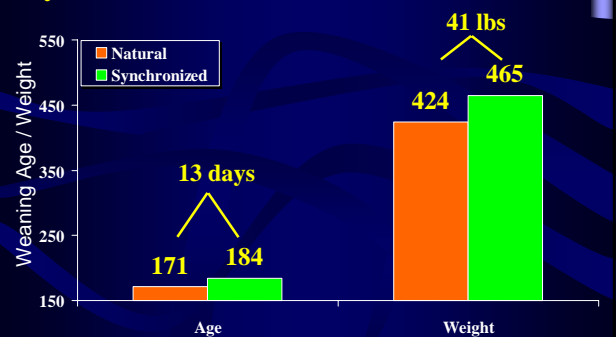
- Calving and postpartum management.
  - Minimum BCS of 5 at calving.
  - Provide early calving assistance.
  - Provide young cows with best feed resources.
  - Feed ionophores.
  - Induce/synchronize estrous cycles.
    - Bull exposure.
    - Hormonal.
    - Temporary calf removal.
  - Early weaning.



## Calving Distribution Goal

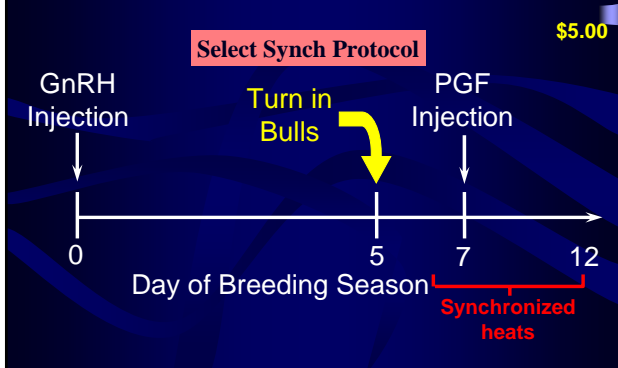


## Potential Advantages of Estrous Synchronization with Natural Service



Schafer et al., 1990

## Estrous Synchronization with Natural Service for Cows

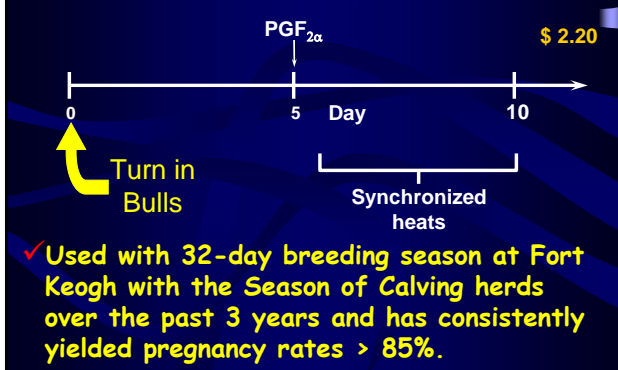


## Benefits with the Select Synch Protocol and Natural Service

### 4 Herds & 915 Cows

- ✓ 5% higher pregnancy rate.
- ✓ 1 day earlier calving date.
- ✓ 10% more cows calved in first 21 days.
- ✓ 11 day shorter calving season.
- ✓ \$26.32 increase in income per cow exposed.

## Synchronization of Estrus in Cyclic Cows/heifers



## Early Weaning during Drought Feasible for your Operation?

Calf Diet Cost (50 to 205 d of age)	-\$75.00
Calf 205 d wt (+ 60 lbs @ \$.95)	\$57.00
Cow feed savings (+ 1 to 1.5 BCS)	\$65 - 100
	+\$47 - 82
Reproductive performance (+ 8 to 38% pregnancy rate) (earlier pregnancies)	???

## How early to "early wean"?

- Goal: Save pasture for fall grazing?
- Improve calf performance?

- Early weaning of entire herd or younger cows only at 3 to 5 months of age.
- 15 to 20% less energy required for weaned calf and cow compared to cow nursing her calf.
- Cows will maintain or improve body condition going into the winter and require less supplemental feed.

## Formula for Androgenized Cows

- **5 Synovex H implants**
  - ~ 2 months
  - Remove implants
- **Testosterone Enanthate (2000 mg)**
  - 500 mg im. + 1500 mg sc.
  - ~ 21 days

## Reproductive Performance by RTS

RTS	No.	Weight (lbs)	Pelvic Area	Estrous Response	Separate Data Set	
					No.	Preg. Rate
1	61	594 <sup>b</sup>	152 <sup>b</sup>	54% <sup>b</sup>	1	0%
2	278	620 <sup>c</sup>	158 <sup>b</sup>	66% <sup>c</sup>	87	79%
3	1103	697 <sup>d</sup>	166 <sup>c</sup>	76% <sup>d</sup>	271	89%
4	494	733 <sup>e</sup>	172 <sup>d</sup>	83% <sup>e</sup>	184	93%
5	728	755 <sup>e</sup>	172 <sup>d</sup>	86% <sup>e</sup>	161	91%
Total 2664					Total 704	

Logic? - \$ 3/hd to identify the 2% of heifers that have only a 54% of responding to synchronization?

## Effect of Rumensin on Puberty and Conception Rates

Group	No. heifers	% Cycling	% Bred
Rumensin	24	92	55
Control	26	58	47

Treatment	Age @ Puberty	% Pregnant
High Roughage	383	83
Rumensin +90% HR	369	96
Rumensin +100% HR	369	96

## Heifer Development to Mature Cow

