

A black bull is shown in profile, standing in a grassy field. The bull is the central focus of the image, with its body and legs clearly visible. The background consists of a green field and some trees in the distance.

Bull Management for Commercial Producers: Nutrition

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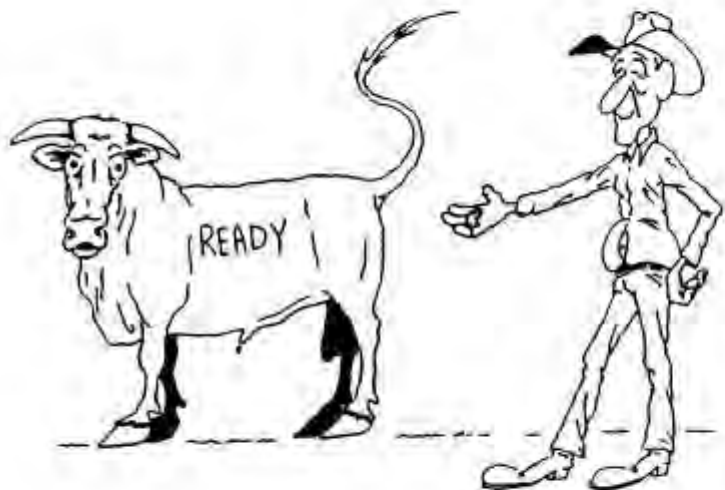
This is not rocket science!



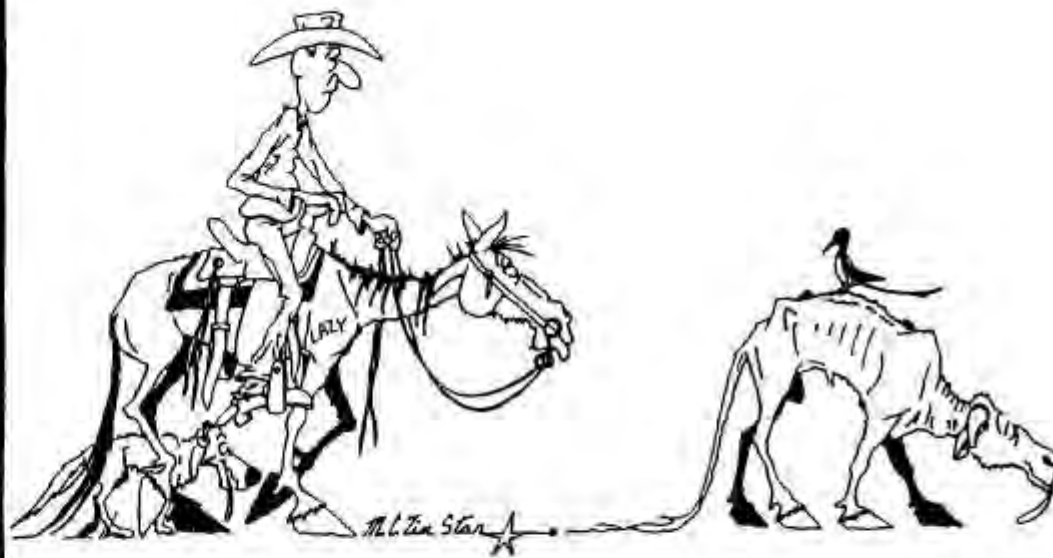
Trying to avoid a wreck!



Matt Hersom, 2008



EARL PROUDLY SHOWS OFF HIS NEW BULL
AFTER THE SPRING SALE ...



EARL TRAILS HIS NEW BULL HOME
IN THE FALL ...

Thoughts on bull management

- Turn bulls out that are similar in age and size
 - Yearlings
 - 2 yr old
 - 3 yr old
 - mature
- Ideally, in multi-sire groups, turn young bulls out in groups that were raised together
 - Social order will be established
- Fertility is a complex trait to access

What makes one bull more fertile than another?

- Semen quality - breeding soundness exam
- Libido- desire to mate
- Serving capacity- ability to mate

- Ideally, a bull should have all three
 - Unfortunately libido and serving capacity do not correlate well to BSE test results!

Are bulls that look masculine more fertile?



Serving Capacity and Libido

- Level of testosterone
 - Degree of muscling
 - Coarseness of hair
 - Size of neck crest
-
- **NONE** of these indicate nor predict libido or serving capacity!

Wiltbank, 1977 (unpublished)

Serving Capacity and Libido

- Research suggest that:

2 yr old bulls of known serving capacity

60 day breeding season

1:50 bull to cow ratio

High serving capacity bulls = 83% preg rate

Low serving capacity bulls = 67% preg rate

Serving Capacity and Libido

- Research suggest that:
 - High serving capacity bulls have a 60-90 lb increase in lbs of calf weaned/cow exposed
 - Higher pregnancy rates
 - Earlier conception rates
 - Purchase fewer bulls
- Hard to access
 - Heifers in estrus
- Observation during the breeding season is the best we can currently do

Breeding Pressure

- 1:25 or 1:30 is typical breeding ratio
 - can be wasteful
 - if serving capacity is known this ratio can be 1:40 or higher

What about using yearling bulls?

Disadvantages?

- Yearling bulls will lose more weight
 - 100-400 lbs
- Require more feed for reconditioning
- Yearling bulls tend to fall in love
- If used hard as a yearling they look “rough” until they are 4-5 years old

What about using yearling bulls? Advantages?

- You increase the number of calves from a bull
 - reduces bull cost
- Higher libido
- Yearling bulls generally cost less
- Yearling bulls are less “picked over”

What about using yearling bulls? Recomendations?

- Yearling bull breeding pressure should equal months of age
 - 12 month bull = 12 cows
 - 18 month bull = 18 cows
 - 2 year old bull = 24 cows

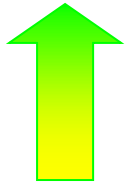
Young Bulls

12 months to 2 years of age

- Many will be “fleshy”
 - Performance testing, marketing
 - Let down (~ 6 months)
 - Provide plenty of exercise
 - Gradually ↓ grain, ↑ roughage
 - Ideal BCS before turnout = 5-6
- Will lose weight during 1st breeding season
 - Cow chasers



Effects of High Energy



Increases Sperm Abnormalities



Structural Problems



Libido

Coulter and Kozub, 1984

Coulter et al., 1987

=



OVERALL
REPRODUCTIVE
PERFORMANCE

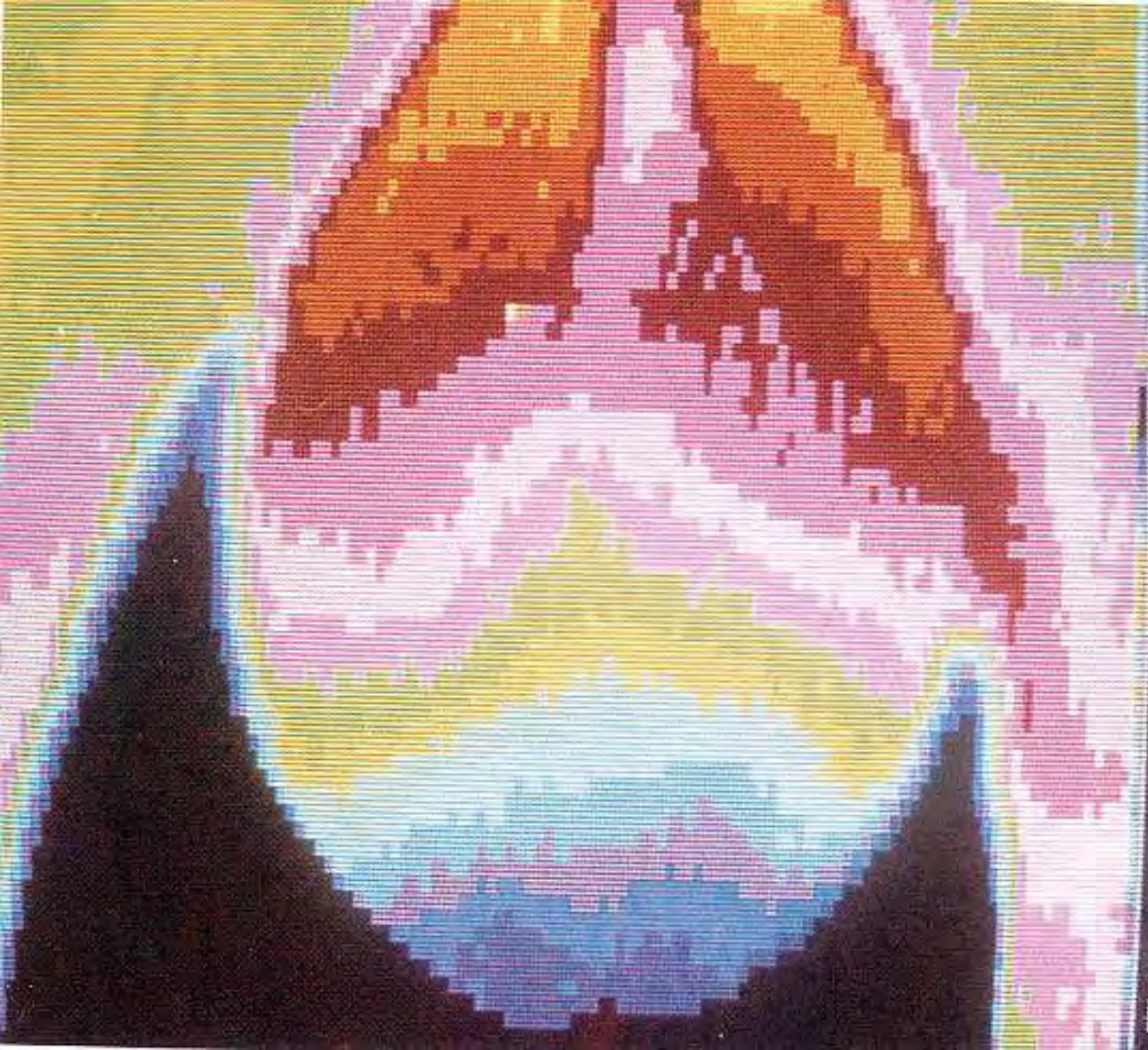
Effects of High Energy Diets on Bull Fertility

Diet Energy Level	100% forage 0% grain	20% forage 80% grain
Body Weight, lb	831	935
Backfat, mm	1.8	4.4
Scrotal Circum, cm	31.1	32.2
Sperm Motility, %	53.4	44.5
Normal Cells, %	68.8	62.5

Adapted from Coulter et al. (1997)

Diet Effects on Bull Fertility

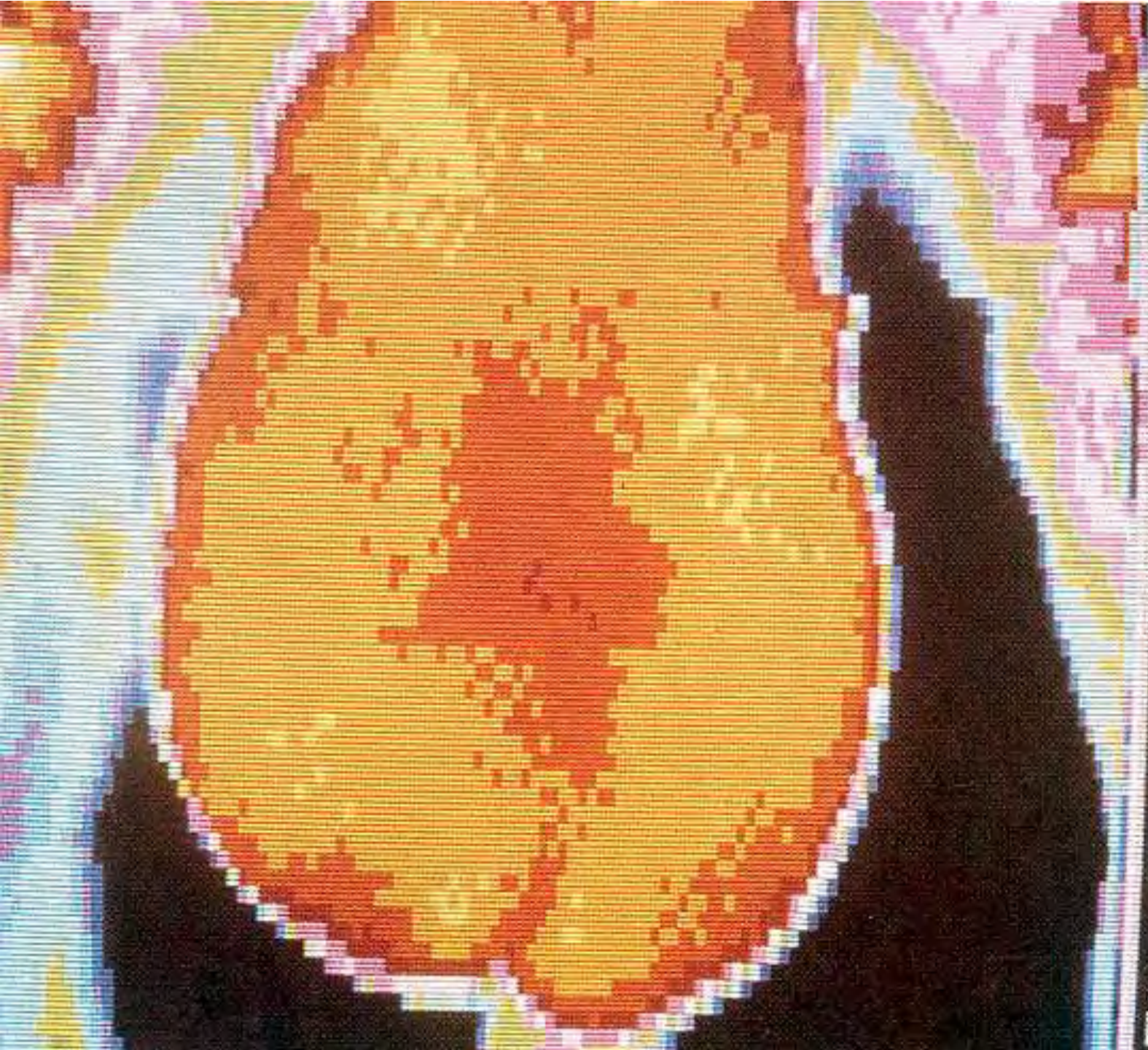
- High energy diets fed to young bulls:
 - increase sperm abnormalities
 - decrease sperm motility
- Deposition of fat within the scrotal tissue and around the neck of the scrotum reduces radiation of heat
- High energy diets increase scrotal surface temp
- These effects are rarely permanent
- Seen more often in bulls with higher genetic potential to get fat = British breeds



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CENT



AGRIC. CANADA
Lethbridge, Alb



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34.5
33.7
32.8
32.0
31.2
30.4
29.6
28.8
28.0
27.2
26.4
25.6
24.8
24.0
CENT



AGRIC. CANADA
Lethbridge, Alb

Scrotal Temperature Relative to Fertility

	Thermogram	
	Normal	Abnormal
Cows/bull	17.7	17.3
Pregnancy Rate, %	83.4	68.3
Rate range (%)	72-100	38-85

Adapted from Coulter et al. (1997)
45 day pasture breeding season

What about rotating bulls?

- As bulls become thin remove them and replace with a bull in better shape
 - Thin bulls are the ones doing the work
 - Likely your high libido bulls
 - Likely your high serving capacity bulls
 - Frequent ejaculation does not reduce sperm quality or numbers
- Introducing new bulls will increase fighting

Questionable practice???

What about rotating bulls?

- Might be a good idea for yearling bulls
 - “All in all out” would be best
 - Turn out young bulls at the end of the breeding season (last 30 days)
 - Wont work well if the last 30 days is in July

Can Bulls Get Too Thin?

<u>BCS</u>	<u>BSE pass rates</u>
<4	55%
4	70%
5	72%
6	67%
>6	62%

Adapted from Barling et al., 1998

Culling Bulls - When is a bull too old?

- Semen quality starts to decline at 6-7 yrs
- Bulls lose their social dominance to younger bulls
- Bulls physical ability to mate begins to decline
 - heavy fronted
 - feet and leg problems associated with size and weight

Disease Prevention

- Vaccinate bulls for the same diseases that you would vaccinate breeding females
 - leptospirosis
 - Vibriosis
 - 4 way viral
- Internal and external parasite control
- One month quarantine for new bulls
- Introduce only virgin bulls to prevent trichomoniasis

Feeding Bulls - Are you doing the right thing?

- In herds with two breeding seasons bulls may need a higher plane of nutrition to recover condition more quickly
- Supplementation of mature bulls may depend on type of breeding program
 - Terminal - more supplement is acceptable
 - Maternal - would like them to make it on the same thing the cows are surviving on

Diet Considerations for Bulls

Growth / Development

- High Energy
- Concentrate based
- Low-Minimal Roughage
- Free Choice / Program Fed
- Minimal Physical Activity
- Encourages Maximal Growth and Overall Condition
- Bull Test Diet

Maintenance / Function

- Generally similar to Cow Ration
- High Roughage / Grazing
- Minimal Concentrate
- High Physical Demand
- Management Opportunity to Transition from Development to Herd Status
- Plan Ahead

Bull Nutrition: Scenario 1

“Letting Down Purchased Bull”

- Purchased bull at 18 months and 1,400 lb in November.
- Growth continues to 1,500 lb target in March.
- Utilize bull at 24 months in March.
- How do we feed and manage him.
 - Brangus, BCS=6
 - Mature BW=2,000 lb
 - DMI=25 lb



Bull Nutrition: Scenario 1

“Letting Down Purchased Bull”

	Option #1	Lb of feed	Option #2	Lb of feed	Option #3	Lb of feed
	Bahiagrass Past	10	Bahia Past	10	Bahia Past	10
	Bahiagrass Hay	7	Bahia Hay	7	Bahia Hay	7
	Soybean Hulls	4	Wheat Midds	2	Corn	3
	Corn Gluten Feed	4	Citrus Pulp	4	DDGS	4
	Molasses	0.5	SBM	2	Urea	0.25
Estimated Average Daily Gain, lb/d						
Nov	1.12		1.13		1.03	
Dec	1.13		1.14		1.14	
Jan	1.06		1.08		1.19	
Feb	1.01		0.99		1.07	

Bull Nutrition: Scenario 2

“Recondition a Terminal Sire Type Bull”

- Reconditioning a mature bull after breeding season.

End Breeding Season
(July)
1,700 lb, BCS=4

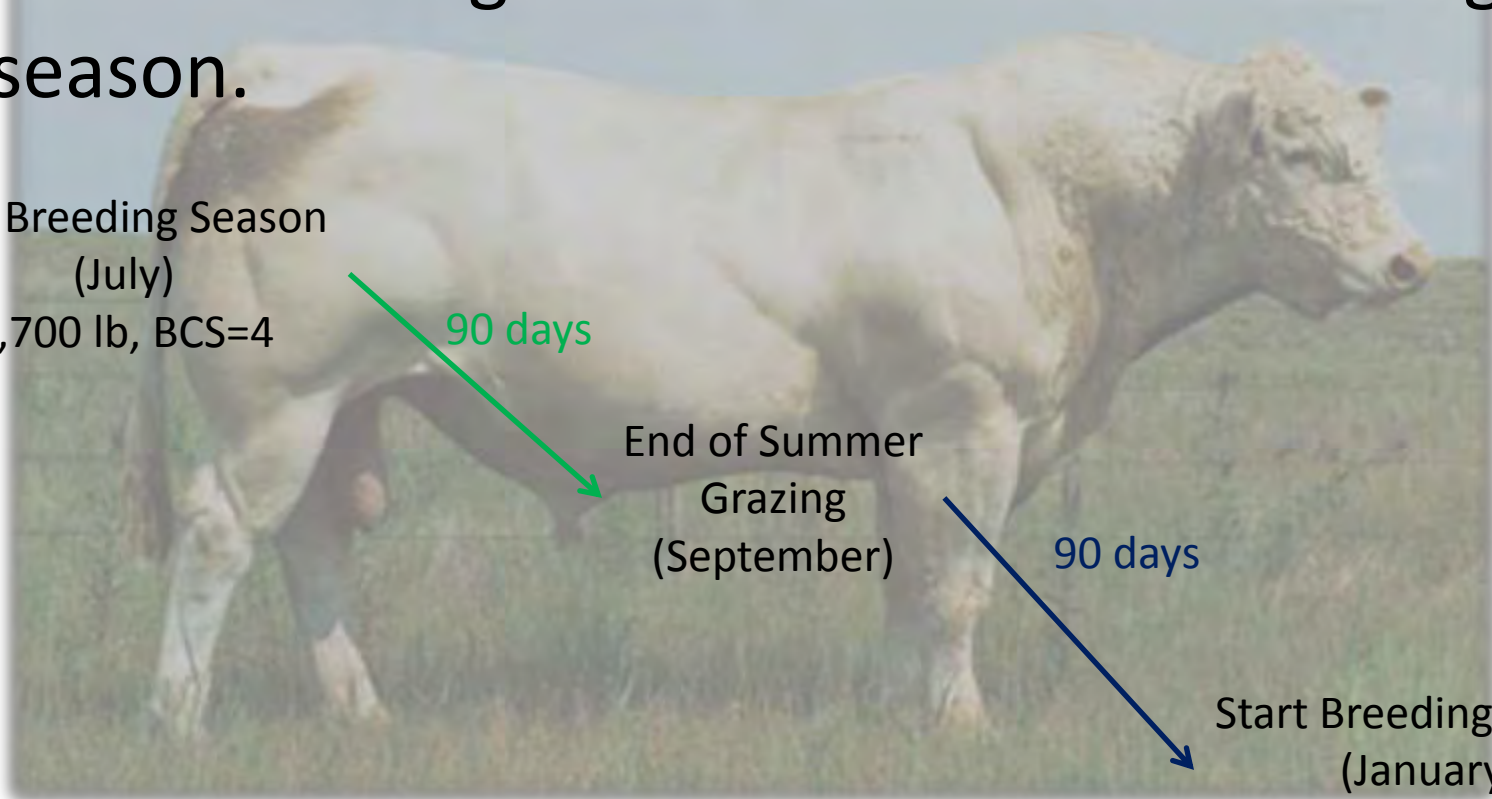
90 days

End of Summer
Grazing
(September)

90 days

Start Breeding Season
(January)

2,000 lb, BCS=6



Bull Nutrition: Scenario 2

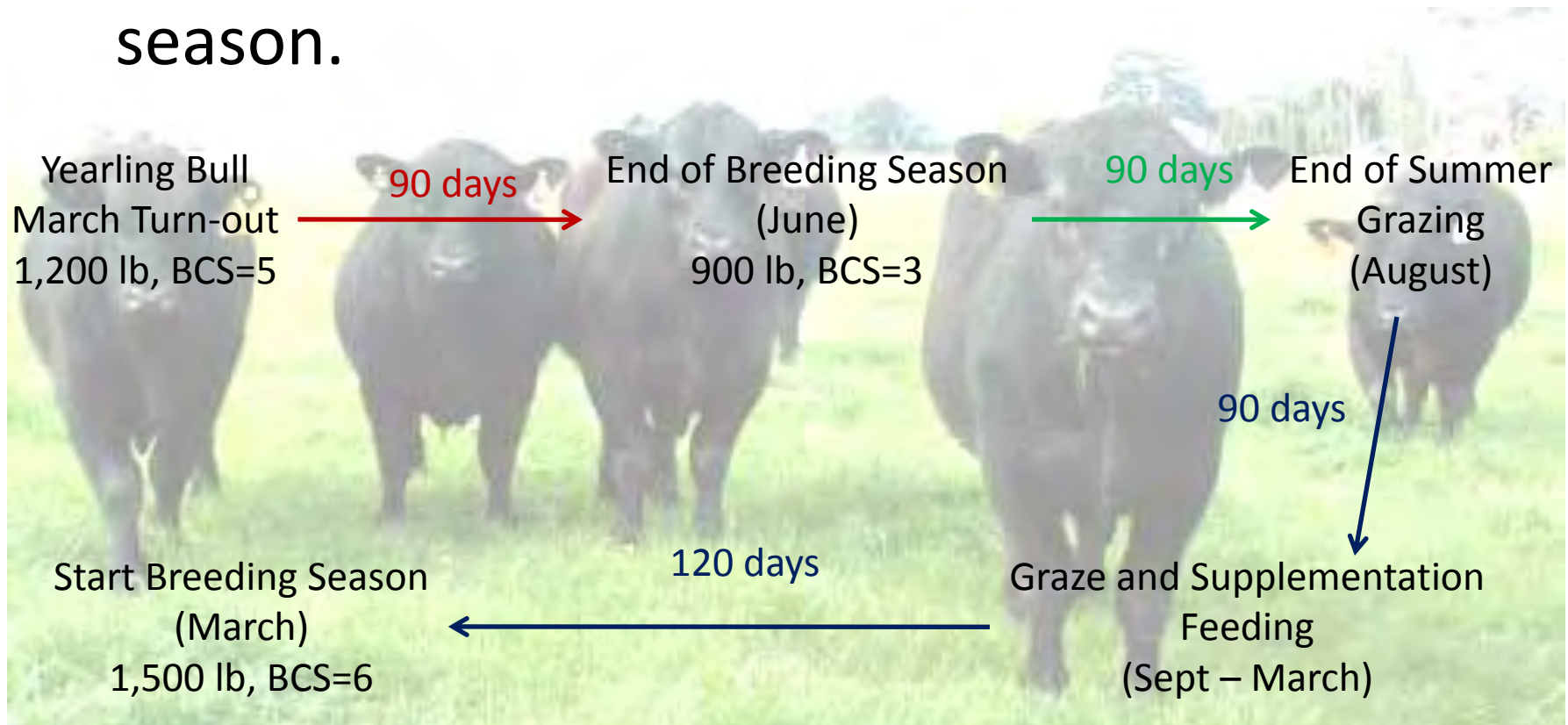
“Recondition a Terminal Sire Type Bull”

Month	Bahiagrass	SBH/CGF/MOL	WM/CP/SBM	Corn/DDG/Urea
Supp Feeds, lb		2.5 / 2.5 / 0.1	2.0 / 2.0 / 1.0	2.5 / 2.5 / 0.0
Graze DMI, lb	30	25	25	25
Predicted ADG, lb/d				
July	0.83	1.15	1.18	1.24
August	0.82	1.14	1.17	1.23
September	0.77	1.10	1.13	1.19
Supp Feeds, lb				
		10 / 10 / 1	9 / 9 / 1	8 / 1 / 0.2
Graze DMI, lb	30	10	11	14
Predicted ADG, lb/d				
October	0.29	2.20	2.14	2.14
November	0.29	2.20	2.14	2.14
December	0.29	2.21	2.15	2.14

Bull Nutrition: Scenario 3

“Utilized Yearling Bull”

- Reconditioning a yearling bull after breeding season.



Bull Nutrition: Scenario 3

“Utilized Yearling Bull”

Assumptions:

- Pasture availability is not limiting.
- Intake potential greater than estimated for current BW
- Supplementation displaces pasture intake.
- 50 lb BW increases each month.

Month	Pasture Intake	Predicted ADG, lb/d
Initial Period BW=900; Initial Period BCS=3		
June	25	1.81
July	25	1.68
August	25	1.54

Bull Nutrition: Scenario 3

“Utilized Yearling Bull”

Month	Pasture Intake	SBH/CGF/MOL	WM/CP/SBM	Corn/DDG/Urea
Initial Period BW=1,050; Initial Period BCS=4				
Supp Feeds, lb		4.5 / 4.5 / 1.0	3.0 / 4.0 / 1.0	4.0 / 4.0 / 0.2
Predicted ADG, lb/d				
September	18	2.21	2.33	2.49
October	18	2.24	2.17	2.34
November	19	2.22	2.16	2.30

Bull Nutrition: Scenario 3

“Utilized Yearling Bull”

Month	Pasture Intake	SBH/CGF/MOL	WM/CP/SBM	Corn/DDG/Urea
Initial Period BW=1,250; Initial Period BCS=5				
Supp Feeds, lb		5.0 / 5.0 / 1.0	5.0 / 5.0 / 1.0	5.0 / 5.0 / 0.3
Predicted ADG, lb/d				
December	17	2.07	2.11	2.28
January	17	1.97	2.11	2.08
February	17	2.01	2.14	2.11
Initial Period BW=1,400; Initial Period BCS=6				
		6.0 / 6.0 / 1.0	5.5 / 6.0 / 1.5	6.0 / 6.0 / 0.3
March	17	2.20	2.45	2.45

Bull Nutrition: Scenario 4

“Maintenance of Mature Bull”

- End the breeding season in July at 1,800 lb and BCS= 5.
- Start next breeding season in January at 2,000 lb and BCS 6.
- DMI = 35 lb
- Summer grazing, Fall grazing / low supplement



Bull Nutrition: Scenario 4

“Maintenance of Mature Bull”

Assumptions:

- Pasture availability is not limiting.

Month	Pasture Intake	Molasses / Urea	Predicted ADG, lb/d
Initial Period BW=900; Initial Period BCS=3			
July	35	--	1.23
August	34	1.0 / 0.1	1.22
September	34	1.0 / 0.1	1.11
October	34	1.0 / 0.1	1.04
November	34	1.0 / 0.1	1.00
December	34	1.0 / 0.1	1.03
January	34	1.0 / 0.1	0.98

TAKE HOME MESSAGE

- Know your bull
 - Current bodyweight / body condition score
 - Expected mature bodyweight
 - Nutrient requirements / needs
 - Maternal vs. Terminal sire types
- Have a plan
 - Adequate pasture
 - Appropriate supplements
 - Nutritional management

TAKE HOME MESSAGE

- Understand Individual Feeding Scenarios
 - Bull nutrition is a function of the Bull and his expected or past service
 - Heavy use of young bulls increases feeding requirements
 - Pasture alone is often not fully adequate to recondition bulls
- *Think about the bull more than at purchase and turn-out.*

Questions



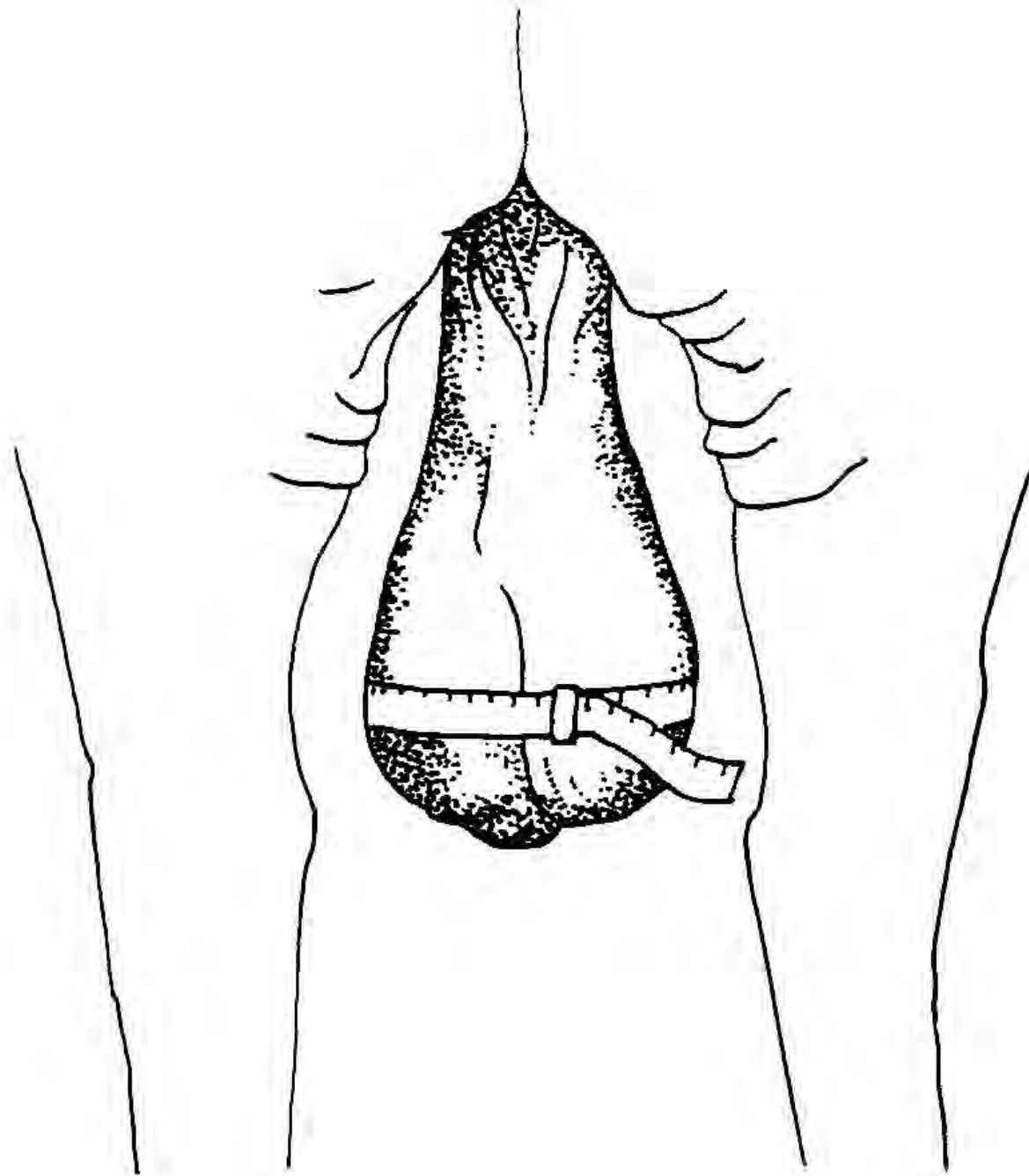
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Matt Hersom, 2008

Traditional methods to assess fertility in bulls-BSE

- Visual assessment of eyes, teeth, feet, legs and external genitalia
- Palpation of accessory sex glands (seminal vesicles and prostate)
- Electroejaculation for sperm collection
- Physical exposure and examination of genitalia
- Scrotal measurement

Should be performed 60 days before turnout



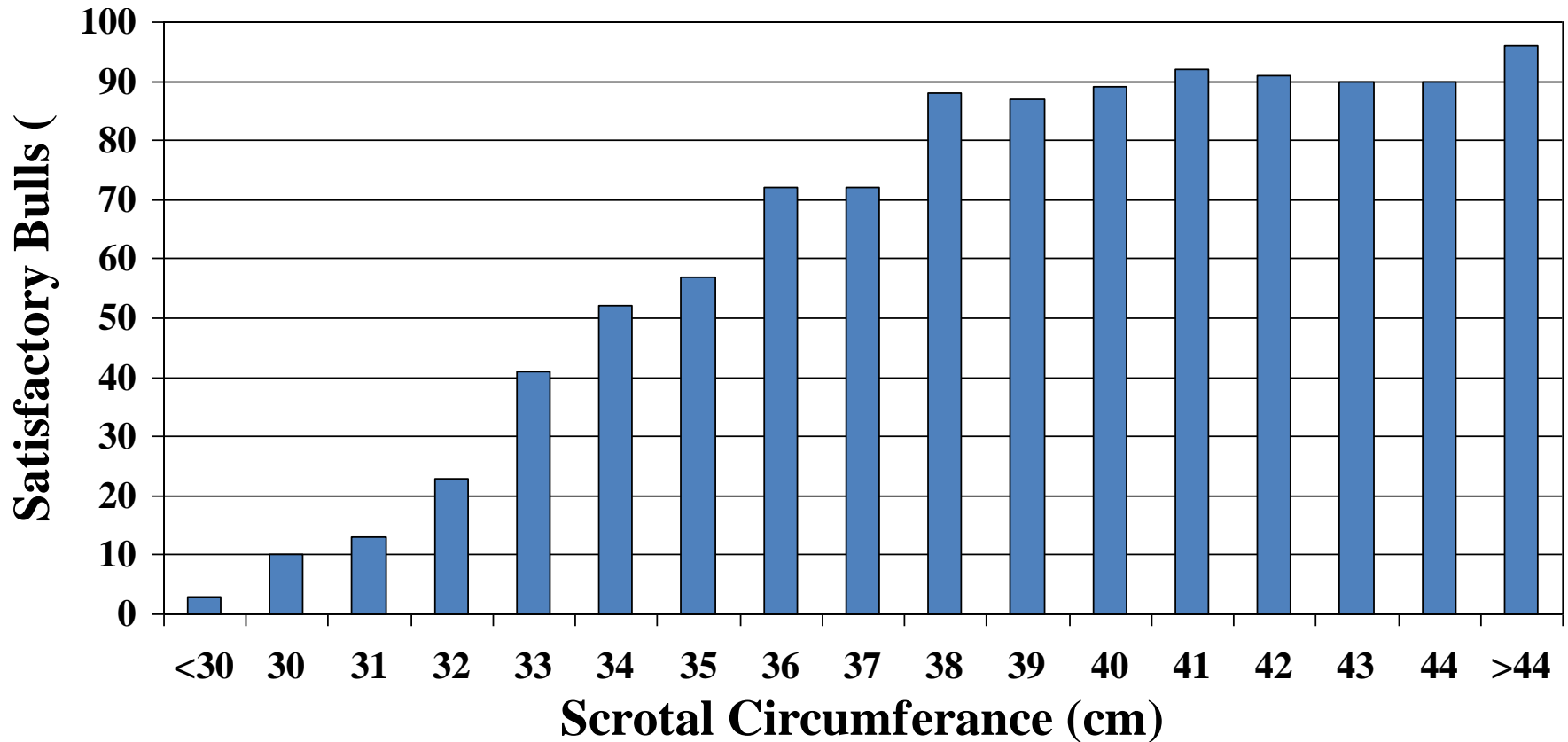
How does
scrotal
circumference
correlate to
fertility?

Scrotal Circumference

- Testicular size:
 - affects sperm quality
 - affects the number of normal sperm cells
 - related to age at puberty in bulls
 - related to age at puberty in a bulls daughter
 - is highly heritable

Scrotal circumference has both short and long term effects on reproduction in the cow herd!

Scrotal Circumference



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Rotating Bulls

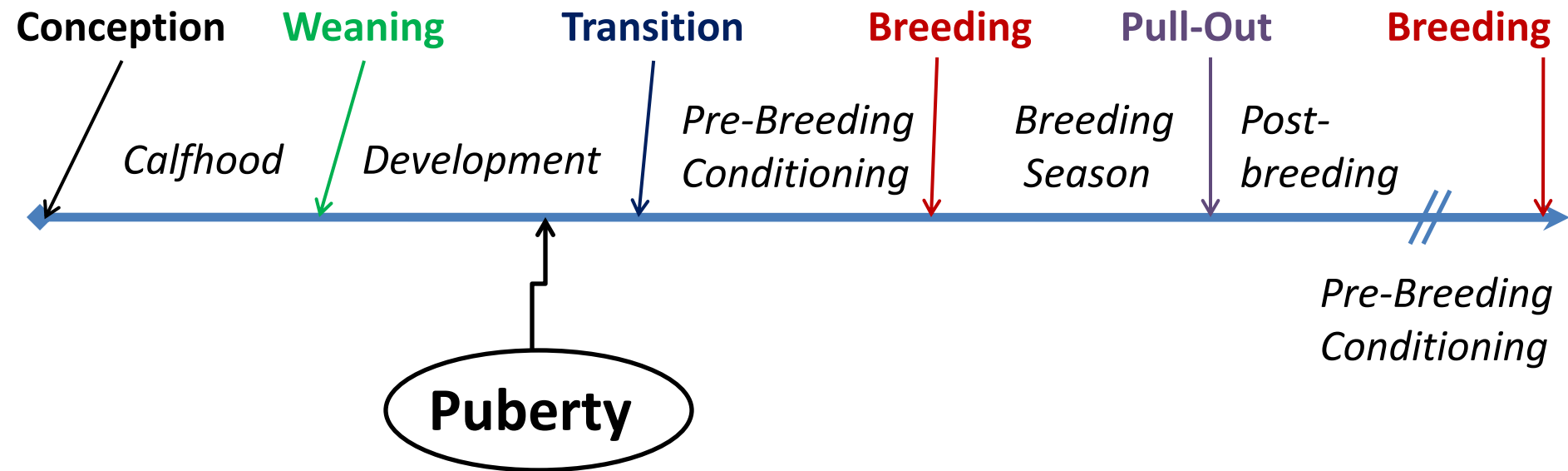
- May not be a good idea
 - The bull you remove because he is thin is most likely your higher serving capacity bull
 - frequent ejaculation does not reduce sperm quality or numbers
- Bulls can be rotated successfully if serving capacity is known

Management of Bulls

- Bulls contribute $\frac{1}{2}$ of the genetic potential for the cow herd
- Development of bulls to reach puberty and service age is critical
- Management of purchased bulls to ensure productivity is vital
- *Bulls are often the forgotten nutritional group*



Periods of Important Nutritional Management for a Bull



Feeding the Growing Bull

- Feed to reach genetic growth potential
- Evaluation of growth potential of offspring
- High level of growth = high diet energy/protein
- Appropriate feedstuffs
 - Energy
 - Protein
 - Roughage



Progress of Bull Productive Development

