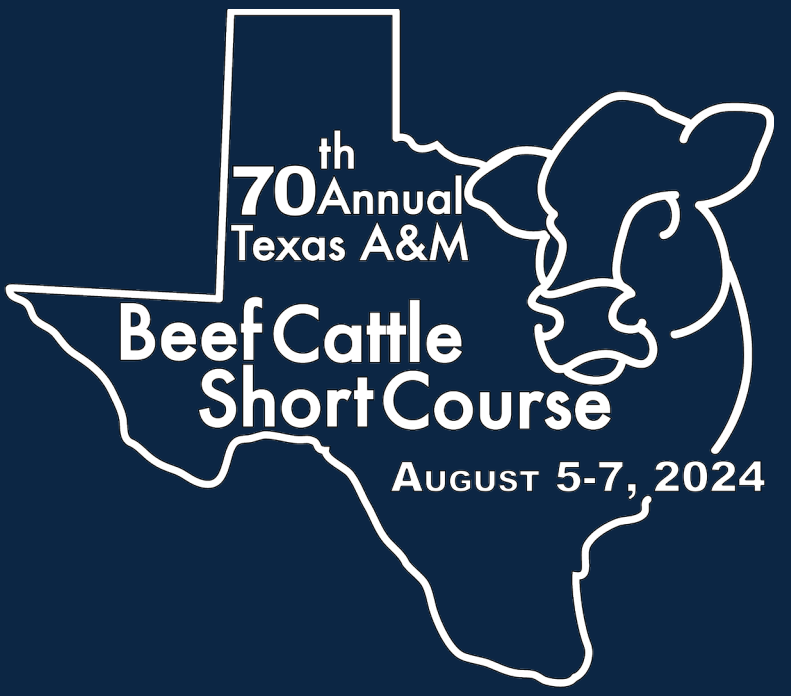
INTRODUCTION TO CATTLE PRODUCTION I and II

Coordinators: Dr. Jason Smith
Dr. Karl Harborth



Introduction to Cattle Production I and II

CAPITAL FARM CREDIT

They're talking beef, but in what language?

Jason Smith, Rick Machen, Ron Gill, and Jason Banta

TEXAS A&M AGRILIFE EXTENSION

They're talking beef, but in what language?

- Production sectors
- Genetics
- Reproduction
- Marketing
- Nutrition

TEXAS A&M AGRILIFE EXTENSION

Questions are welcome and ENCOURAGED

TEXAS A&M AGRILIFE EXTENSION

Why own land?

- Inheritance
- Family heritage
- Investment
- Practice stewardship
- Produce something
  - Beef
  - Wildlife
  - Recreational experience
  - Consumable (timber, turf)

Why own cattle?

- Produce food
- Provide income
- Manage property tax liability
- Tradition/heritage
- Manage habitat
- Recreation/hobby
- ***Sustainability?***

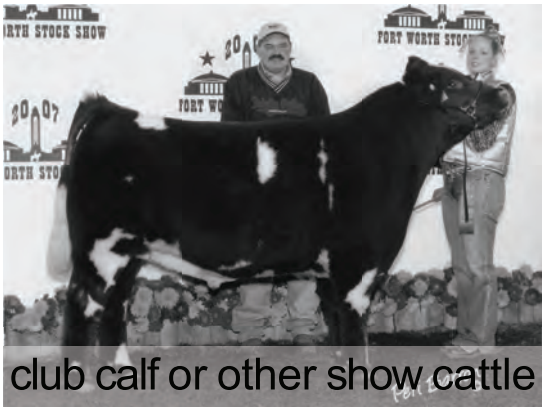
Registered/seedstock cow/calf

operating span of the average seedstock producer?

Commercial cow-calf

stocker operation

traditional stocker operation



Natural
NHTC
Grassfed
Organic

half brothers (same sire)

Genetics

Intro to Beef Production Session

Bos Taurus Breeds

Cattle of:
- Europe
- North-eastern Asia
- Parts of Africa

Commonly Referred to as:

(British and Continental)

British Breeds

Continental Breeds

Bos Indicus Breeds

Cattle of:
- South Asia

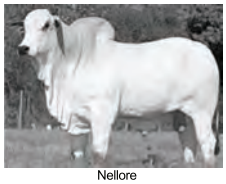
Commonly Referred to as:

Zebu Cattle

Sometimes known as humped *cattle* or Brahman *cattle*,
They are characterized by a fatty hump on their neck, drooping ears and a large dewlap.


Guzerat


American Brahman


Nellore

Bos Indicus Breeds

Gyr

Indu Brazil

Krishna Valley

American Bos Indicus Breeds

American Grey Brahman


American Red Brahman

American Breeds

Cattle resulting from:

- Crossing of Bos Taurus and Bos Indicus

Commonly Referred to as:

- Bos Indicus Influenced Breeds
- Brahman Breeds
- Brahman Crosses


Brangus


Beefmaster

Bos Indicus – American Breeds

Santa Gertrudis

Braford

Simbrah

What % of genes come from the bull?

What % of genes come from the cow?

dominant genes

recessive genes

homozygous: ■ ■

heterozygous: ■ ■

Coat Color Basics

black: 100%
red: 0%

	B	B
b	Bb *black*	Bb *black*
b	Bb *black*	Bb *black*

black: 75%
red: 25%

	B	b
B	BB *black*	Bb *black*
b	Bb *black*	bb *red*

black: 50%
red: 50%

	b	b
B	Bb *black*	Bb *black*
b	bb *red*	bb *red*

X

100% red

bb

Horned and Polled Genes (Bos taurus)

PP or Pp

pp

How often should you rotate the bull, in single sire herd?

Expected Progeny Difference

Expected Progeny Differences (EPDs)

An estimated measure of the genetic impact of a parent on his/her offspring

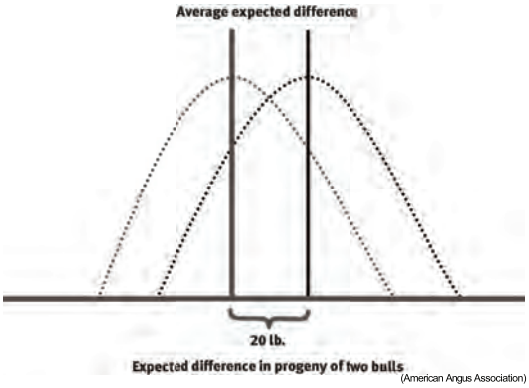
All breeds that have EPDs, have EPDs for:

- birth weight
- weaning weight
- yearling weight
- milk

Comparing Bulls

Bull	WW EPD
A	44
B	64

- both bulls mated to similar cows
- calves from bull B would be expected to average 20 lbs heavier at weaning

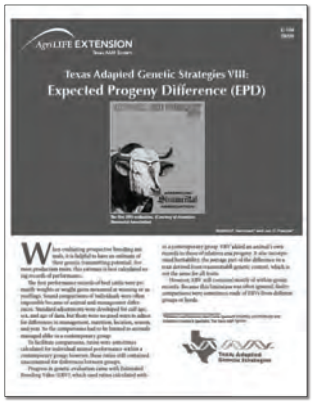


(American Angus Association)

Comparing to Breed Average

Bull	BW EPD
A	-1.0
B	+1.5
breed average	+3.0

4 lb
1.5 lb



heritability: the amount of variation in a particular trait that can be attributed to inherited genetic factors in contrast to environmental factors

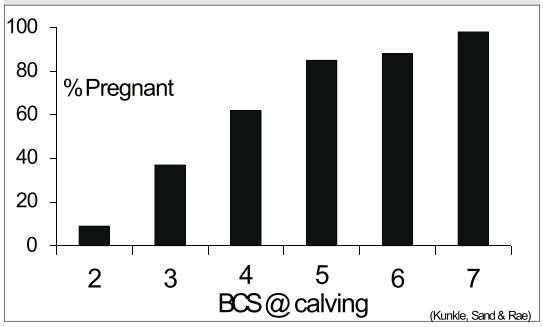
Trait	Heritability	Level of Heterosis
Carcass/end product Skeletal measurements Mature weight	High	Low (0 to 5%)
Growth rate Birth weight Weaning weight Yearling weight Milk production	Medium	Medium (5 to 10%)
Maternal ability Reproduction Health Cow longevity Overall cow productivity	Low	High (10 to 30%)

[a] Adapted from Kress and MacNeil. 1999.

U.S. body condition scoring system

BCS images courtesy of: FutureBeef (1), Matt Hersom (2), and Jason Smith (3 – 8)

Effect of BCS on Pregnancy Rate



A Complete Breeding Soundness Exam involves:

- Physical exam of the reproductive organs,
  - palpation of the secondary sex glands
  - extension and exam of the penis
  - examine for deformities injuries or hair rings

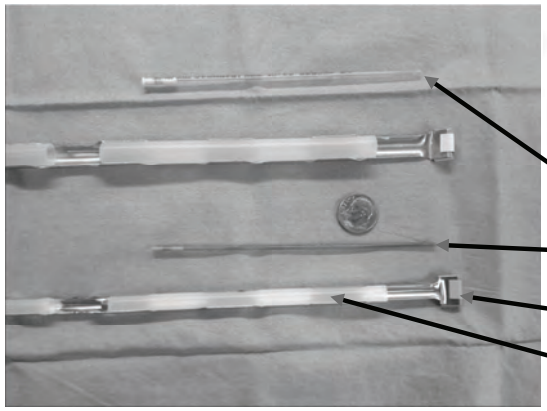
In addition it requires:

- Semen collection and evaluation for
  - motility and
  - morphology
- Does not insure fertility because it does not assess libido

bull bred/natural service

Artificial
Insemination

Semen Tank



Semen straws

½cc straw

¼cc straw

Cane

Goblets

breeding/calving season

standing heat

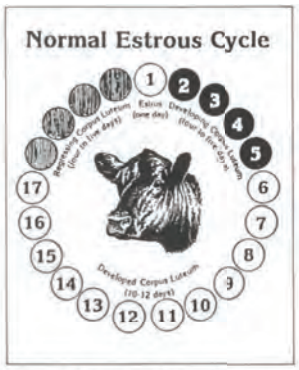
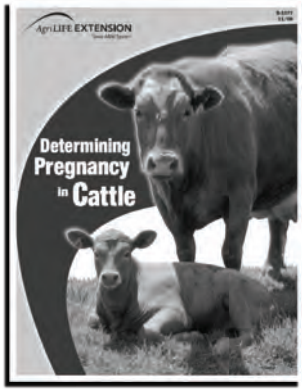
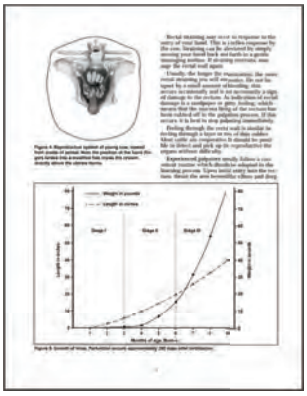


Figure 17.9. Illustration of the normal 21-day estrous cycle in the bovine.

estrous cycle





Rectal palpation

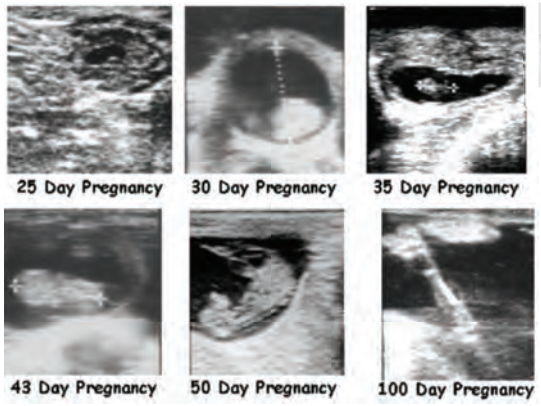
Can determine pregnancy status as early as 45 days.

Experienced palpators can determine approximately how far along in gestation a cow is.

Can determine as pregnancy as early as ~ 30 days.

Lets you know if bred or not but no indication of how many months into gestation unless you know the date of conception.

Ultra-sound Technology



Can determine as early as 25 days as to whether a cow is pregnant. Can accurately determine stage of pregnancy through first 3 to 4 months.

Photo credit G.C. Lamb

Marketing & Miscellaneous Terminology

Cows have calved and are running with a bull but have not been confirmed pregnant

3-in-1

Cow has calf at side and has been confirmed pregnant

calf *vs* yearling

Calf is still nursing its dam

Yearling has been weaned from its dam and is 8-15 months of age

bull *vs* steer

Auction receipt?

"knife cut"

stockers

Weaned steers, heifers or young bulls grazing pastures

When used in this context it refers to the weight on a 100# weight basis (cwt)

#1 Okies

Predominately Hereford, Angus or black baldy or out of British type cows. Can get a few exotic cross **calves** in a group. The **number** refers to thickness (muscling).

In general it refers to cattle that are a mix of different breeds

In Texas it usually indicates some Brahman influence in the calf

In general it refers to cattle that have the appearance of some Longhorn breed influence

feeders

Cattle that are around 750 pounds or heavier that are ready to go to a feedlot for finishing

finish
finishing

Fed cattle
Live cattle

Female bovine descriptions

- Heifer calf
- Weaned heifer
- Yearling heifer
- 1st calf heifer
- 2nd calf heifer
- Young cow
- Mature cow
- Solid mouth cow
- Packer cow

baby tooth

short term cows

Body condition score

Fleshing ability

F-1

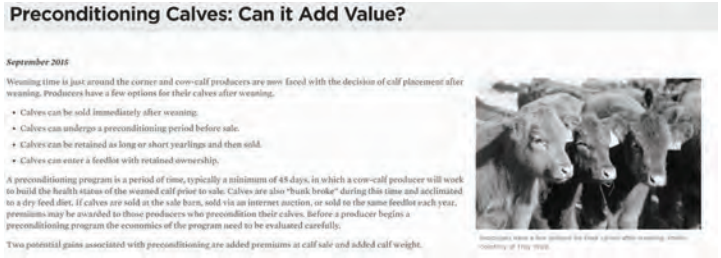
mature size

udder

teats

shrink

preconditioning



Preconditioning Calves: Can it Add Value?

September 2015

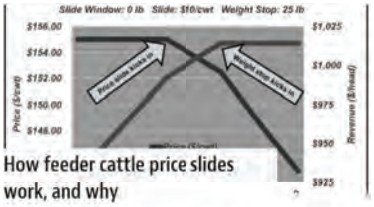
Weaning time is just around the corner and cow-calf producers are now faced with the decision of calf placement after weaning. Producers have a few options for their calves after weaning.

- Calves can be sold immediately after weaning.
- Calves can undergo a preconditioning period before sale.
- Calves can be retained as long or short yearlings and then sold.
- Calves can enter a feedlot with retained ownership.

A preconditioning program is a period of time, typically a minimum of 45 days, in which a cow-calf producer will work to build the health status of the weaned calf prior to sale. Calves are also "bunk broke" during this time and acclimated to a dry feed diet. If calves are sold at the sale barn, sold via an internet auction, or sold to the same feedlot each year, premiums may be awarded to those producers who precondition their calves. Before a producer begins a preconditioning program the economics of the program need to be evaluated carefully.

Two potential gains associated with preconditioning are added premiums at calf sale and added calf weight.

slide



How feeder cattle price slides work, and why

Price slides are a fact of life in marketing feeder cattle. Here's a look at how it works.

AgriLIFE EXTENSION

Using a Slide in Beef Cattle Marketing

Jordan Cattle Auction
May 2, 2015

SAN SABA, TX – Receipts totaled 3569 head. Buyers came from Louisiana, Arkansas, Oklahoma, New Mexico, and all across Texas along with 637 on the internet. The pairs

Rep Sales:

Joe Sagebiel, 6 bmf pair, 3700.00
D&R Livestock, 13 bmf pair, 3500.00
D&R Livestock, 40 angus pair, 3750.00
D&R Livestock, 31 angus pair, 3400.00
Aelvoet Farms, 8 registered angus heifers MB, 3050.00
Goddard Ranch, 20 hereford pair, 3550.00
Texas Stardance Cattle, 14 hereford heifers open, 2500.00
Martin-Bruni Cattle, 5 bmf pair, 3700.00
DB Farms, 3 angus pair, 3200.00
DB Farms, 12 angus cows LB, 2700.00
DB Farms, 8 angus cows LB, 2700.00
DB Farms, 21 angus cows MB, 2575.00
DB Farms, 20 angus cows MB, 2675.00
DB Farms, 9 angus cows SB, 2450.00

SB – short bred
MB – mid bred
LB – long bred

"times the money"

Other terminology

BQA

www.texasbeefquality.com

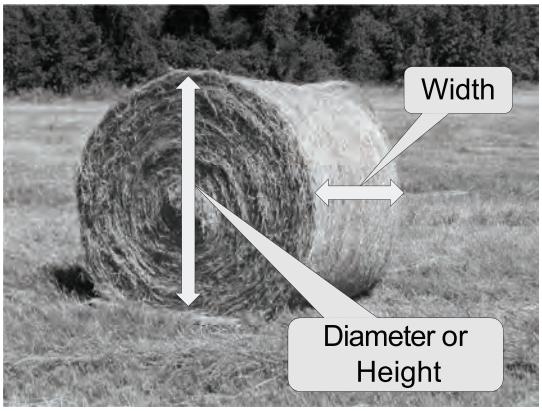
See monthly BQA tips in:
- The Cattleman
- Gulf Coast Cattleman

implants

heat stress

If we are not good stewards of the soil…

Stored Forages



Which is bigger?

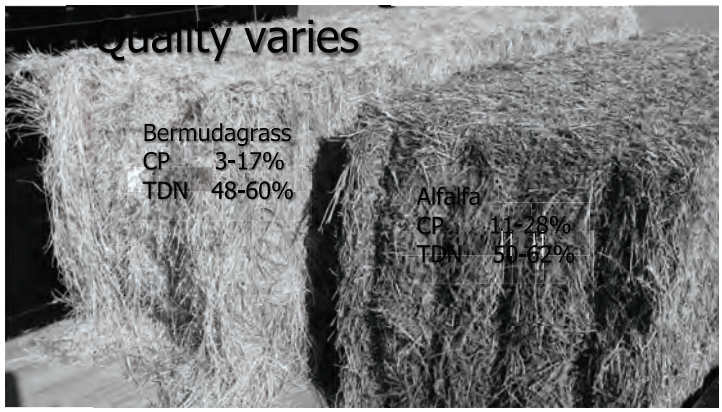
4′ x 6′
or
5′ x 5′

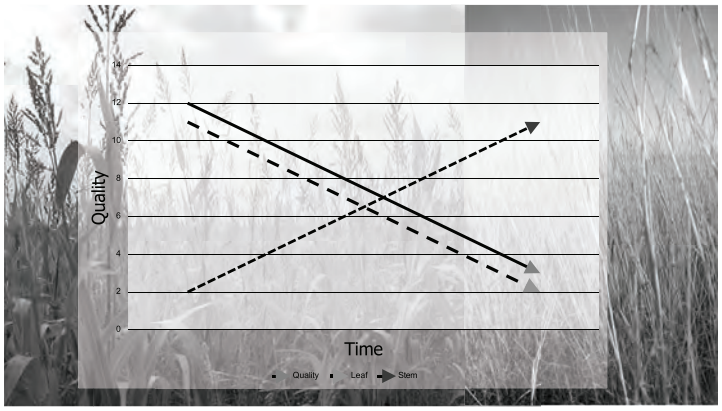
Bale Size & Weight

Table 1. Effect of bale size on bale weight and value of large round bales

Bale width, ft	Bale diameter, ft	Bale volume, ft³	Estimated bale weight, lb[1]	Bale size, % of a 5′ × 5′ bale	Bale value in relation to a 5′ × 5′ bale[2]	Price per ton if bale cost $50.00[3]
4	4	50	563	51	$25.60	$177.56
4	5	79	880	80	$40.00	$113.64
4	6	113	1,267	115	$57.60	$78.91
5	5	98	1,100	100	$50.00	$90.91
5	6	141	1,584	144	$72.00	$63.13

[1] Assumes all bales are the same density as a 5′ × 5′ bale that weighs 1,100 lb (11.21 lb/ft³).
[2] Assumes all factors are equal except bale size and weight.
[3] Price per ton assuming all bales, regardless of size and weight, cost $50 each.




14
12
10
8
6
4
2
0
Quality
Time
Quality
Leaf
Stem


Wasted Hay


baleage or haylage


(picture courtesy of Connor Marketing, Inc.)

silage


roughage


Corn stalks

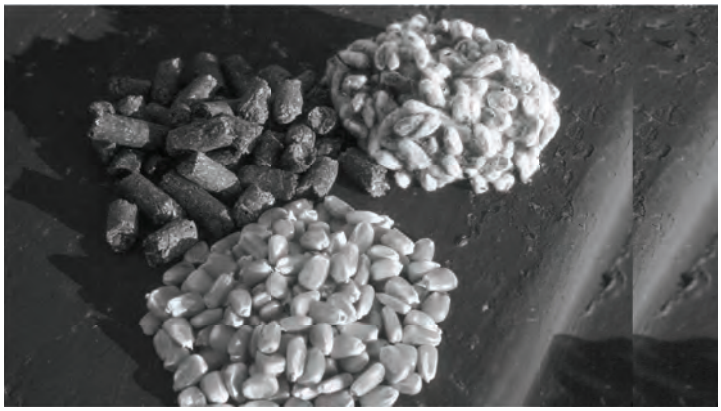

Cotton burrs


Cottonseed hulls


Grass hay

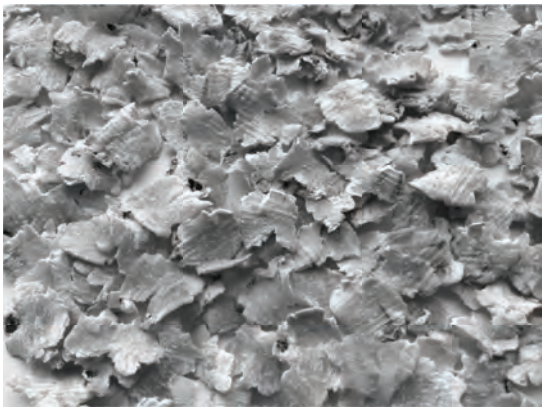
20% Breeder Cubes

41%
Cottonseed
Cake



Tubs & Blocks

While salt contains two minerals (NaCl), it is NOT a mineral Supplement!!

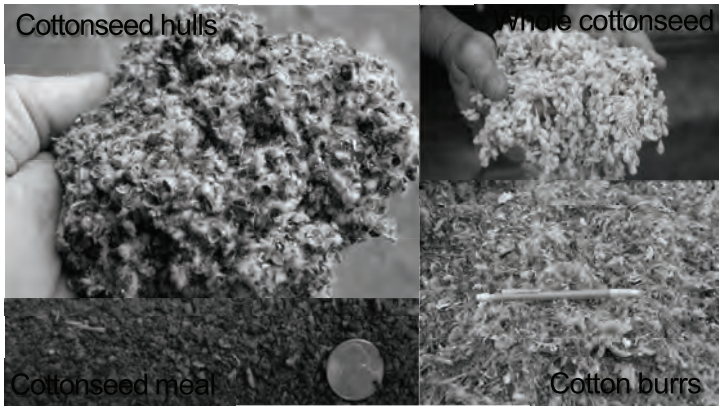


Steam-flaked Corn

Corn silage

Distiller's dried grains (DDG)

Brewer's grains

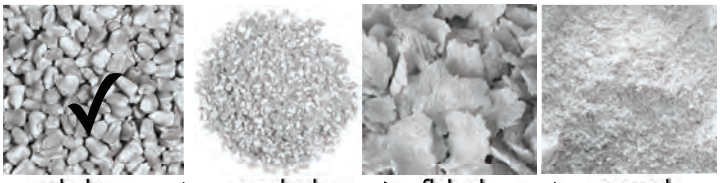


Finishing ration

This ration is "hot."

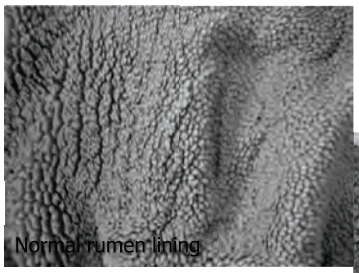
Acidosis

pH 0	Battery Acid
pH 1	Stomach Acid
pH 2	Lemon Juice, Vinegar
pH 3	Orange Juice, Soda, Some Dental Rinses
pH 4	Tomato Juice, Beer
pH 5	Black Coffee
pH 6	Saliva, Cow's Milk
pH 7	Pure Water
pH 8	Sea Water, pH-Neutralizing Dental Rinses
pH 9	Baking Soda
pH 10	Antacids
pH 11	Antacids, Dental Treatment Rinses
pH 12	Soapy Water



Processing grains increases the rates at which the starch can be fermented by rumen bacteria

Rapid fermentation of starch decreases rumen pH



Damaged rumen lining allows
Bacteria to enter the bloodstream
Go to the liver
Abscesses form

Damage to rumen lining

Cause: rumen acidosis
Effect: disrupts P3-hoof wall attachment
Result: cattle walk softly, tender footed

Founder
(Laminitis)

Resources

http://beef.tamu.edu

Introduction to beef production II

- A cattlemen's guide to body condition
- Establishing and maintaining defined calving and breeding seasons

A cattlemen's guide to body condition

2024 Texas A&M Beef Cattle Short Course

Introduction to Cattle Production II – August 6th, 2024

Dr. Jason Smith
Associate Professor and Extension Beef Cattle Specialist
Department of Animal Science
Texas A&M AgriLife Extension - Amarillo

A cattlemen's guide to body condition

- Provide an overview of the U.S. beef body condition scoring system
- Why we as beef cattle producers should care about body condition
- How and when to monitor body condition
- How to put that information into use on your operation

Overview of the U.S. body condition scoring system

- U.S. beef system uses a scale of 1 through 9 to subjectively rate the state of body condition for a particular animal
- Body condition scores serve as a primary indicator of nutritional status
  - Ideal BCS for mature cows at calving and breeding is ≥ a 5
  - Ideal BCS for first-calf heifers at calving is 1 score greater than mature cows
    - If mature cows calve at a 5, heifers should calve at a 6

Why does body condition matter?

- Body condition serves as an indicator of nutritional status
- Nutrition is the primary environmental factor that influences an animal's productivity
  - Animals in an ideal state of body condition are more likely to realize their genetic potential for…
    - Reproduction, health, and longevity
    - Calf growth, efficiency, reproduction, and health

Nutrient partitioning (prioritization)

Maintenance and lactation

↓

Growth

↓

Existing pregnancy

↓

Estrous cycle and establishment of a new pregnancy

What is the ideal BCS at calving?

BCS	Postpartum interval to return to estrus
3	89 d
4	70 d
5	59 d
6	52 d
7	31 d

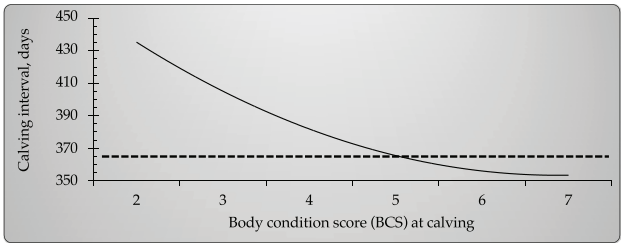
Adapted from Houghton et al., 1990

What is the ideal BCS at calving?

BCS	Overall pregnancy rate
2	13 %
3	43 %
4	66 %
5	94 %
6	100 %

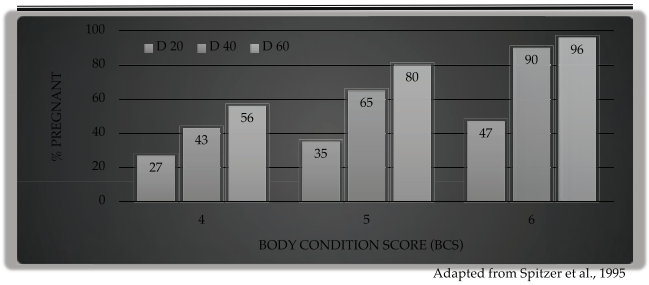
Adapted from Kunkle et al., 1994

Effect of BCS at calving on calving interval



Adapted from Kilkenny (1978) and Kunkle et al. (1994)

What is the ideal BCS at calving?



Adapted from Spitzer et al., 1995

Simple descriptions of BCS

BCS	Simple description	
1	Extremely emaciated	Too thin
2	Emaciated	
3	Thin	
4	Borderline, slightly thin	Functional
5	Modest	
6	Moderate	
7	Fat	
8	Obese	Too fat
9	Extremely obese	

Body condition score (BCS) examples

BCS images courtesy of: FutureBeef (1), Matt Hersom (2), and Jason Smith (3 – 8)

Weight associated with BCS change

BCS	Adjusted weight, lbs	Difference from BCS 5, lbs	
1	931	- 369	Too thin
2	1,023	- 277	
3	1,115	- 185	
4	1,208	- 92	Functional
5	1,300	--	
6	1,392	+ 92	
7	1,485	+ 185	
8	1,577	+ 277	Too fat
9	1,669	+ 369	

Weight changes relative to a 1300 lb cow at a BCS of 5; change ranges from approximately 7.5% to 10% per body condition score

Reference landmarks

1) Ribs
2) Spine and topline
3) Tailhead
4) Hooks (hips) and pin bones
5) Brisket
6) Hindquarter

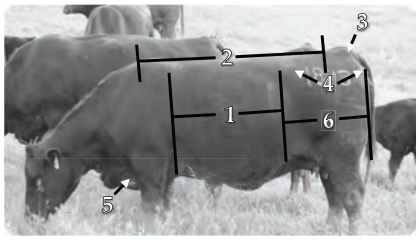


Image and animation from Jason Smith

Body condition scoring

Body condition score 1

EXTREMELY EMACIATED

- No fat can be felt or visually observed over the animal's topline, hip, or ribs
- Tailhead and ribs are very prominent
- Represents health and welfare concerns, due to starvation
- Reproduction will not occur

Image courtesy of FutureBeef (Australia)

Body condition scoring

Body condition score 1 – extremely emaciated

Images courtesy of Dr. Gary Bates and Dr. Ky Pohler, respectively

Body condition scoring

Body condition score 2

EMACIATED

- Tailhead and ribs are less prominent than BCS 1, but still prominent
- Small amount of tissue covering the first few ribs
- Spine can be visually observed and easily palpated
- Reproduction, calf performance, and health will be severely and negatively impacted

Image courtesy of Dr. Matt Hersom

Body condition scoring

Body condition score 2 - emaciated

Images courtesy of Dr. Matt Hersom

Body condition scoring

Body condition score 3

THIN

- Thin, but not emaciated
- Individual ribs are identifiable, but covered with slightly more tissue than BCS 2
- Small amount of fat observed over the topline, tail-head, and top of the ribs, but spine is still visible
- Reproduction will be negatively impacted

Image courtesy of Mrs. Lou Nave

Body condition scoring

Body condition score 3 - thin


Images from Jason Smith and courtesy of Dr. Rick Machen, respectively

Body condition scoring

Image from Jason Smith

Body condition score 4

BORDERLINE

- Individual ribs are much less obvious
- Spine is still somewhat prominent, but much less than for lower BCS
- Noticeable amount of fat covering is evident on most ribs, the topline, hips, and tailhead
- Reproduction may be slightly impaired

Body condition scoring

Body condition score 4 - borderline

Images from Jason Smith and courtesy of Dr. Rick Machen, respectively

Body condition scoring

Image from Jason Smith

Body condition score 5

MODEST

- Good condition
- Fat covering all ribs, and noticeable deposits over the topline, hip, tailhead, and pins
- Healthy, fit appearance, with noticeable muscle mass
- Ideal condition for productivity

Body condition scoring

Body condition score 5 - modest


Images from Jason Smith

Body condition scoring

Image from Jason Smith

Body condition score 6

MODERATE

- Great condition
- A greater amount of fat is evident in the animal's topline, over its ribs, and on its hip and tailhead
- Muscle shape should be evident
- Great for productivity, but may not be economical to maintain

Body condition scoring

Body condition score 6 - moderate

Images from Jason Smith

Body condition scoring

Image from Jason Smith

Body condition score 7

FAT

- Slightly over-conditioned, but performance will not be negatively impacted
- Fleshy and carries an excess amount of fat
- Excess fat is evident over the hips, pin bones, and tailhead

Body condition scoring

Body condition score 7 – fat

Images from Jason Smith

Body condition scoring

Image from Jason Smith

Body condition score 8

OBESE

- Over-conditioned to the extent that it may impact productivity
- Excessive amount of fat covering the ribs, topline, and hips, and large deposits located near the tailhead and over the pin bones
- Likely to have a negative impact on fertility and increase dystocia

Body condition scoring

Body condition score 8 – obese

Images from Jason Smith

Body condition scoring

Image courtesy of Dr. Neal Schrick

Body condition score 9

EXTREMELY OBESE

- Cow appears to be morbidly obese, to the extent that will substantially hinder productivity
- Fat deposits extremely large, and large accumulations are pronounced over the pins, tailhead, and ribs
- Reproduction will be substantially impaired, and dystocia should be expected

Body condition scoring

Body condition score 9 – extremely obese

Images courtesy of Dr. Dan Eversole and The Ohio State University, respectively

Cheat sheet…questions to ask yourself

- Is she ideal, thinner than ideal, or fatter than ideal?
  - If she's ideal, she's a 5 or a 6
    - 5 – she looks like she's in good condition, fit, but maybe in "clean working clothes"
    - 6 – she's in good condition, maybe a little extra fat showing, but the condition you'd want to show off

Image courtesy of Dr. Ron Gill and Dr. Rick Machen

Cheat sheet…questions to ask yourself

- Is she ideal, thinner than ideal, or fatter than ideal?
  - If she's thinner than ideal, she's a 1, 2, 3, or 4
    - 1 (rare) – looks like she's on her death-bed
    - 2 – terribly thin, but still somewhat thrifty, and you can't count every single bone in her skeleton
    - 3 – you can still see quite a few bones, only a little bit of muscle, and little to no fat, but she isn't emaciated
    - 4 – she's just a touch on the thin side

Images courtesy of Dr. Rick Machen

Cheat sheet…questions to ask yourself

- Is she ideal, thinner than ideal, or fatter than ideal?
  - If she's fatter than ideal, she's a 7, 8, or 9
    - 7 – she's a little more fat than ideal
    - 8 – she's really fat, but not to the extent that she can't hardly move around
    - 9 (rare) – almost all you can see is fat, and walking around appears to be difficult or strenuous

Image from Jason Smith

Additional rules of thumb

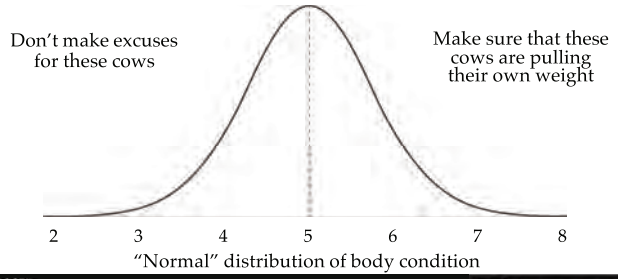
- Don't forget the bulls
  - Same concepts apply
  - Expect muscling to be more evident, even at lower condition scores
- Corriente- and longhorn- influenced cattle
  - Appear to be thinner than others at a given state of condition
- Heavily Brahman-influenced cattle
  - Don't confuse loose or excess skin with fat
- Cattle with heavy/winter hair coats
  - Can be difficult to see through

Image from TX BQA program and Jason Smith, respectively

When to evaluate cattle?

- Every time you see them
  - Be on the lookout for the highs and lows
- Most critical times
  - Beginning of the breeding season
  - Weaning
  - Beginning of the calving season
- Provides the opportunity to make necessary changes
  - Need to understand that it does not make economic sense to maintain cows at a standard BCS
    - Use the good times to increase BCS to a level that will keep it high enough during the bad times

Variation within a herd



"Normal" distribution of body condition

Identifying the source of problems

- Less than ideal BCS
  - Small portion of the cattle
    - Those individuals are likely not matched to your environment and management, or may have been driven by a health event
  - Large portion of the cattle have less than ideal BCS
    - Nutrition is likely the issue – over-grazing/over-stocked, under-supplemented

Identifying the source of problems

- Greater than ideal BCS
  - Small portion of the cattle
    - They may be more efficient than the others, or they aren't working hard enough for you (previously open, lost a calf, low calf performance)
  - Large portion of the cattle
    - They are likely being overfed, or have been open for too long

Additional resources

- Publications
  - http://beef.tamu.edu
    - Publications
      - Nutrition
        - Body Condition Scoring
        - Body Condition, Nutrition & Reproduction of Beef Cows
- Ranch TV
  - https://ranchtv.org/
    - View video library
      - Market cow management

Questions on body condition?

TEXAS A&M UNIVERSITY
Animal Science

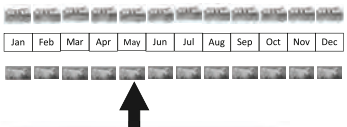
Establishing / Maintaining a Defined Breeding & Calving Season

Ryon Walker, Ph.D, PAS
Operations Manager
McGregor Research Center

CATTLE ADAPTED TO TROPICAL & SUBTROPICAL ENVIRONMENTS | PRODUCTIVITY & DEVELOPMENTAL PROGRAMMING | SAFETY, QUALITY, & NUTRITION OF FOOD PRODUCTS | STUDENT & STAKEHOLDER ENGAGEMENT IN ANIMAL SCIENCE | QUANTIFIABLE ANIMAL PERFORMANCE

What is a Defined Calving Season?

TEXAS A&M UNIVERSITY Animal Science

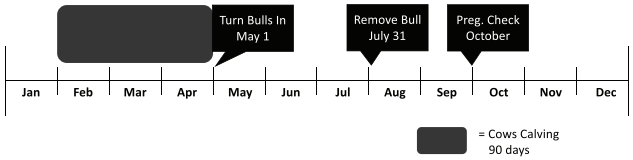


A calving season that has a beginning and ending date that is shorter than 365 days! That will depend on:

- Time of year you want to wean and market!
- What is your feed/forage resources!
- When is your vacation or hunting trip!
- When are your grandkids sporting events!
- When do you want to get paid!
- How often do you want to get paid!

What is a Defined Breeding Season?

TEXAS A&M UNIVERSITY Animal Science



Estrous Cycle length:	21 days
Estimate weight/day of age:	2 lbs
Market price (500 lbs):	$2.45/
21 days X 2 lbs =	42 lbs
42 lbs X $2.45 =	$102.90

Benefits of a Short Calving Season

- Focused management
- Better Planning
- Easier to identify dystocia
- Uniform calf crop
- Manage Open Cows
- Match Nutrient Requirements more Efficiently
- Increased revenue

Calving Distribution

Percent of females calving in the 1st, 2nd, and 3rd 21 days of the calving season.

	First Cycle	Second Cycle	Third Cycle	Preg. Rate	Avg. WW
Example 1	30%	30%	30%	**90%**	**513**
Example 2	10%	20%	60%	**90%**	**495**
Example 3	60%	20%	10%	**90%**	**533**

Difference in pounds weaned when comparing the different examples.

Example 1 vs. 3

30 Cows = ↑ 600 lbs.

50 Cows = ↑ 1000 lbs.

100 Cows = ↑ 2,000 lbs.

Example 2 vs. 3

30 Cows = ↑ 1140 lbs.

50 Cows = ↑ 1900 lbs.

100 Cows = ↑ 3800 lbs.

Source: Rhinehart, 2022

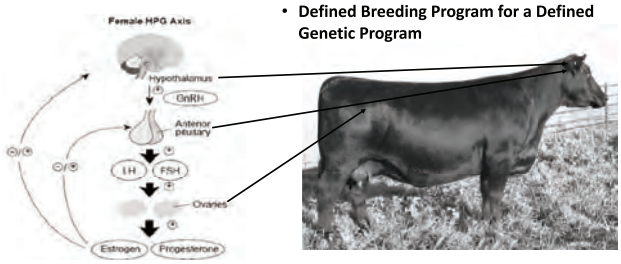
Its All About Your Goals….

What are you managing for?

- **Life**
- **Money**
- **Calf Crop Uniformity**
- **Reduced Labor - Calving Difficulty**
- **Match Forage Availability**
- **Fertility**

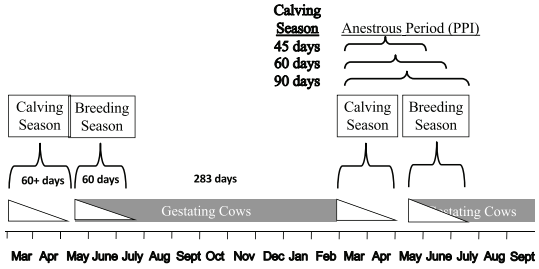
What are we managing?

- **Reduce Open Females/Cull Percentage**
- **Improve Herd Fertility**
- **Defined Breeding Program for a Defined Genetic Program**



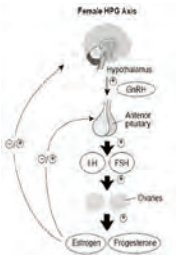
Source: Rhinehart, 2022

Reproductive Cycle – 60 d Breeding Season

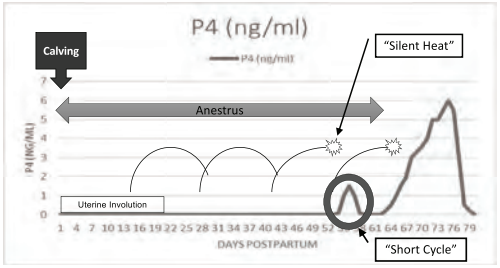


Source: (Rhinehart, 2022) – *Ultimate goal is for a cow to calve 1 time every 365 days. That means she has 82 days (on average) to recover and get rebred. The later in the calving season she calves, the shorter her time to recover is if you have a defined calving season.*

Anestrus

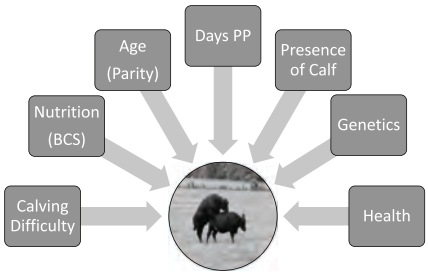


Anestrus – Period following calving until first heat where the female is not cycling.



Source: Rhinehart, 2022

Factors Regulating Length of Postpartum Anestrous



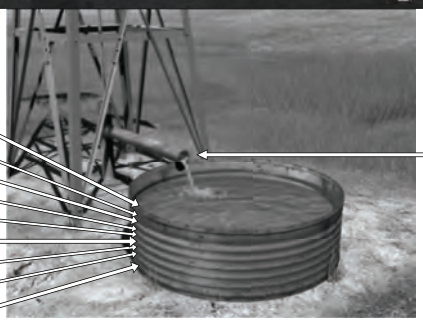
Source: Rhinehart, 2022

BCS = Body Condition Score PP = postpartum interval

Postpartum Cow "Water Tank"

Order of importance where nutrients are partitioned

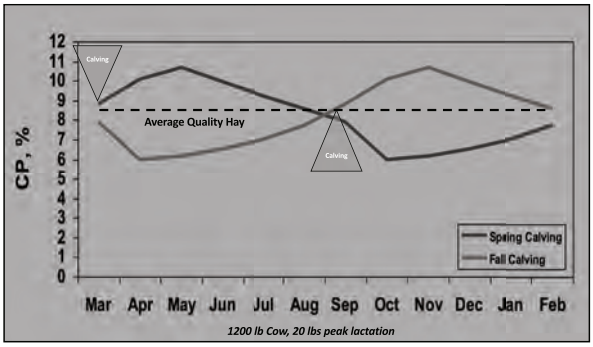
1. Basal Metabolism
2. Activity
3. Growth
4. Basic Energy Res.
5. Pregnancy
6. Lactation
7. Add. Energy Res.
8. Estrous Cycle
9. Excess Reserves



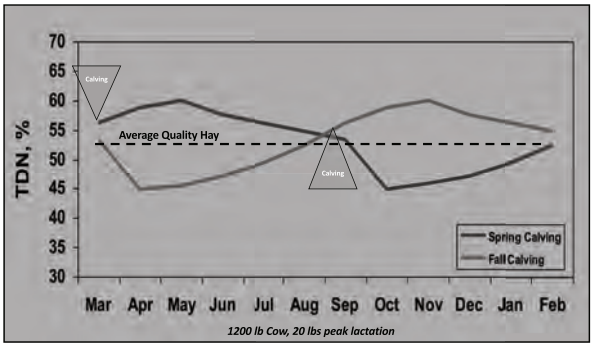
Nutrients (Energy, CP) the Cow Consumes

Source: Rhinehart, 2022
Source: Short et al., 1990

Nutrient Requirements for Protein (CP)



Nutrient Requirements for Energy (TDN)



What does that Cow Need!

Do these hay examples provide the nutrients required for a 1200 lb cow at these stages of production?

1200 lb Pregnant Cow:

1 month prior to calving	-	DMI – 24.1 lbs	CP – 8.0%	TDN – 55%
At calving	-	DMI – 24.6 lbs	CP – 8.8%	TDN – 56%

Feedstuff Analysis

Bermuda Hay (*new, covered*)	CP – 8.2%	TDN – 60%
Bermuda Hay (*new, uncovered*)	CP – 7.6%	TDN – 58%
Bermuda Hay (*old, uncovered*)	CP – 8.5%	TDN – 46%
Ryegrass (*Spring*)	CP – 22.2%	TDN – 70%
Dried Distillers Grain	CP – 30.0%	TDN – 80%

What does that Cow Need!

Do these hay examples provide the nutrients required for a 1200 lb cow at these stages of production?

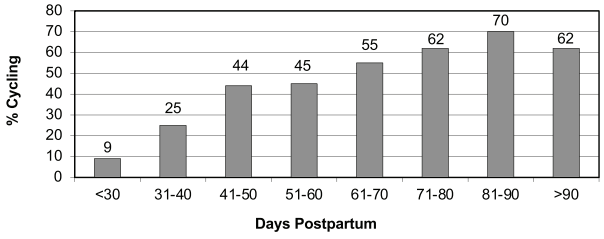
1200 lb Lactating Cow:

1 month after calving	-	DMI – 26.8 lbs	CP – 10.1%	TDN – 58.7%
3 months after calving	–	DMI – 28.4 lbs	CP – 9.9%	TDN – 57.6%

Feedstuff Analysis

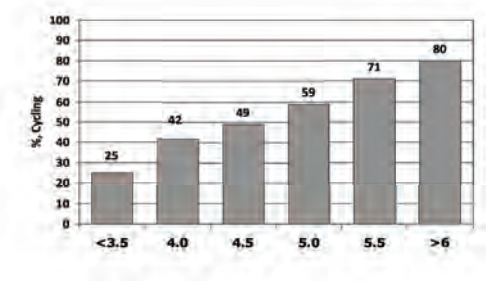
Bermuda Hay (*new, covered*)	CP – 8.2%	TDN – 60%
Bermuda Hay (*new, uncovered*)	CP – 7.6%	TDN – 58%
Bermuda Hay (*old, uncovered*)	CP – 8.5%	TDN – 46%
Ryegrass (*Spring*)	CP – 22.2%	TDN – 70%
Dried Distillers Grain	CP – 30.0%	TDN – 80%

Influence of Days Postpartum on % Cycling



Source: Stevenson et al., 2003

Effect of Body Condition on % Cycling



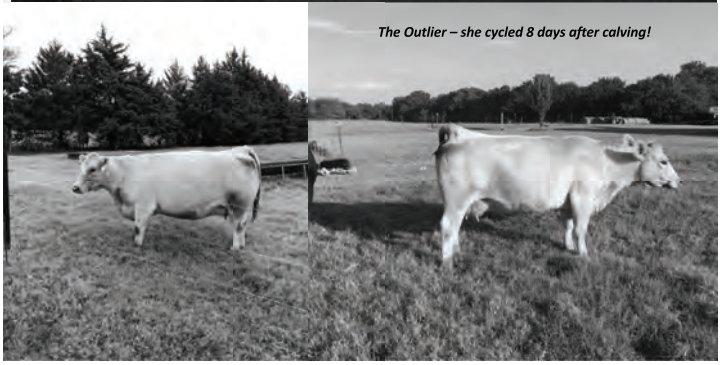
Source: Stevenson et al., 2003

Influence of Body Condition on Return to Estrus

Body Condition Score	Postpartum Interval, days
3	88.5
4	69.7
5	59.4
6	51.7
7	30.6

Source: Houghton et al., 1990

Influence of Days Postpartum on Anestrus



Play the "Long Game"

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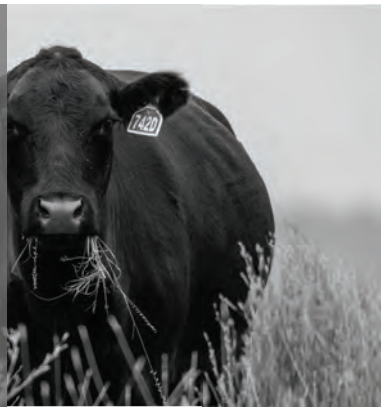
Which Example do you Prefer?

	First Cycle	Second Cycle	Third Cycle	Pregnancy Rate	Avg. DPP Next Season
Example 1	30%	30%	30%	**90%**	**39**
Example 2	10%	20%	60%	**90%**	**27**
Example 3	60%	20%	10%	**90%**	**51**

Source: Rhinehart, 2022

JOB DESCRIPTION OF A COW

1. Calve by 24 months of age
2. Must calve every 365 days
3. Must calve without assistance
4. Must maintain her body condition (BCS 5) throughout the year
5. Must provide sufficient resources for the calf to reach its genetic potential
6. Have a great disposition



Establishing a Defined Breeding/Calving Season

How do we get there?

How do we get there?

TEXAS A&M UNIVERSITY Animal Science

Three-year transition from year-round to 90-day calving season

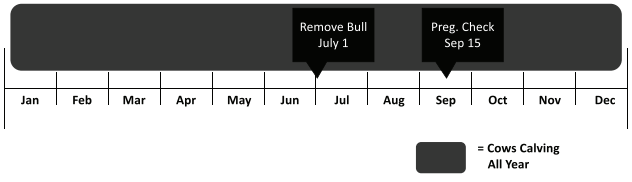
- Avoids extreme culling in a single year
- Makes use of natural, seasonal distribution
- Lets' you get comfortable with the associated management practices

Source: Rhinehart, 2022

Calving Season in 3 Years - Example

TEXAS A&M UNIVERSITY Animal Science

YEAR 1

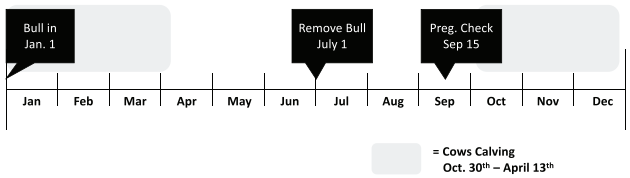


Source: Rhinehart, 2022

Calving Season in 3 Years - Example

TEXAS A&M UNIVERSITY Animal Science

YEAR 2



Source: Rhinehart, 2022

Calving Season in 3 Years - Example

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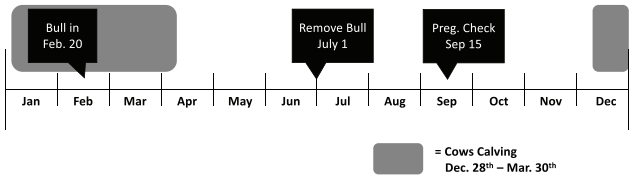
YEAR 3



Source: Rhinehart, 2022

Calving Season in 3 Years - Example

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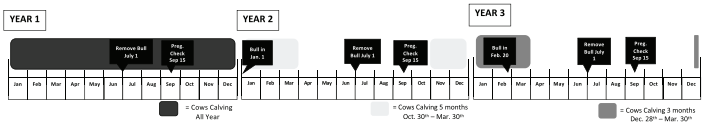
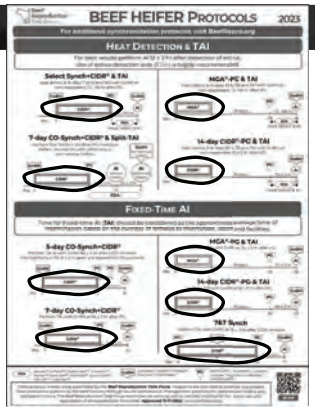
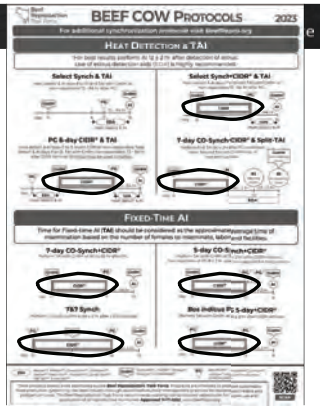


Source: Rhinehart, 2022





Impact of TAI on Calving Day

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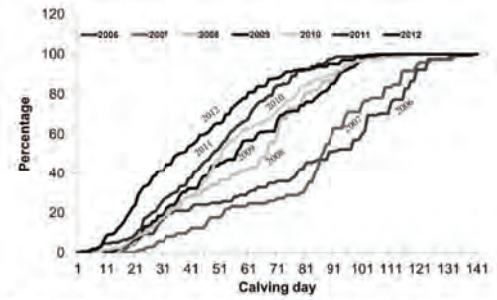

Figure 6. Cumulative calving by year for two years (2006 and 2007) prior to introducing TAI and five years (2008 to 2012) after introducing TAI.

Source: Rhinehart, 2022

Anestrous

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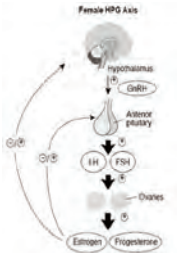
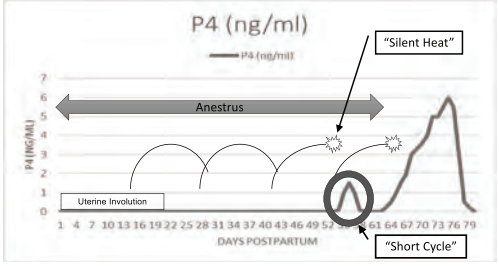
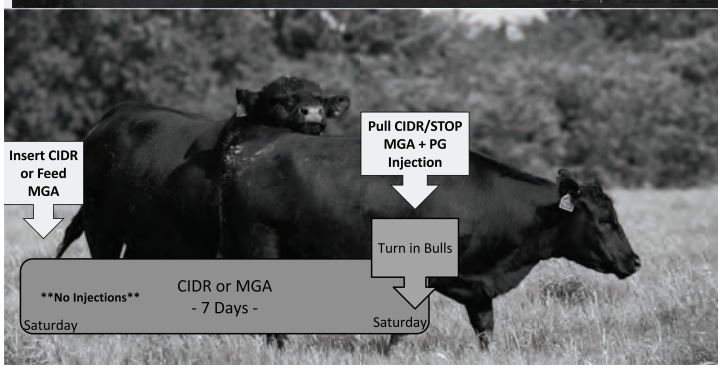




Source: Rhinehart, 2022

Synchronization of Estrus for Natural Service



Synchronization of Estrus for Natural Service

Treatment	Numbers	Preg. Rate	1st 30 Days
Control	621	83	47
MGA	614	93	78
Control	419	83	45
CIDR	421	91	80

Bull:Cow range from 1:23 to 1:42 *(Source: Rhinehart, 2022)*

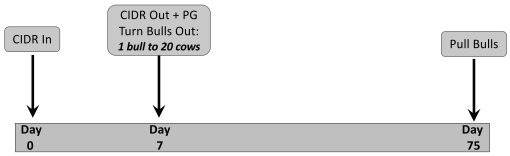
Other Tips & Tactics

Use Estrous Synchronization in Thin Cows

- Thin cows take longer to cycle during the postpartum period (BCS ≤ 4).
- Progesterone based (CIDR or MGA) protocols can induce cyclicity in anestrous cows and prepubertal heifers.

	Not Cycling	Cycling
	Pregnancy Rates to Timed-AI	
Demeterco et al., 2017 **(cows)**	42.9%	46.9%
	34% ≤ BCS 4	44.4% > BCS 4.5
Walker et al., 2005 **(heifers)**	54.4%	55.2%

Bull Synch

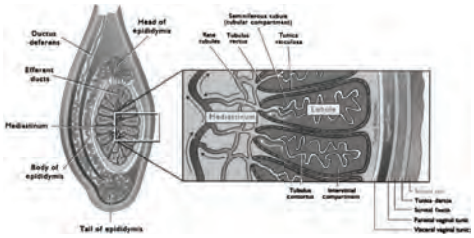


2015 - **cows < 45 days postpartum were synchronized with this protocol**
- ***63%*** conception rates in first 30 days of breeding season

2016 - **cows < 30 days postpartum were synchronized with this protocol**
- ***53%*** conception rates in first 30 days of breeding season

Source: Walker, 2016

Breeding Soundness Exam



Source: Rhinehart, 2022

Find Out Who is Open!

Source: Rhinehart, 2022

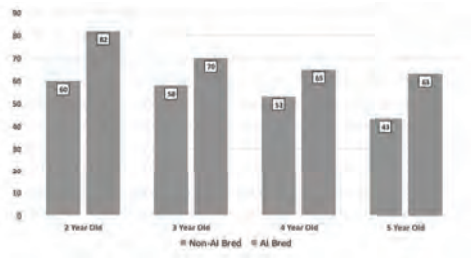
Find Out Who is Open!

Methods of Pregnancy Determination

Method	Earliest You Can Detect	Accuracy
Rectal Palpation	35 to 45 days	95%
Ultrasound	28 days	99%
Blood Test (BioPRYN) *Pregnancy-Specific Protein B*	28 days or ≥ 72 days after calving	97%
Blood Test DG29 – Genex *Pregnancy associated protein*	29 days or ≥ 90 days after calving	98.7%
IDEXX Bovine Pregnancy Test *PAG*	28 days or ≥ 60 days after calving	97+%
Estrotect Patch	17 days	≈ 90%

Regardless of What it Takes!

Replacement Heifer Retention in the Herd



- FIGURE 1: PERCENTAGE OF TIMED-AI OR NATURAL SERVICE BRED REPLACEMENT HEIFERS FOLLOWING THE FIRST BREEDING SEASON RETAINED IN THE HERD THRU 5 YEARS OF AGE.

Source: Walker, 2019

Beef Herd Profitability

Which has a greater impact on *economic returns?*

Growth Rate
Herd Reproductive Performance
Product Quality

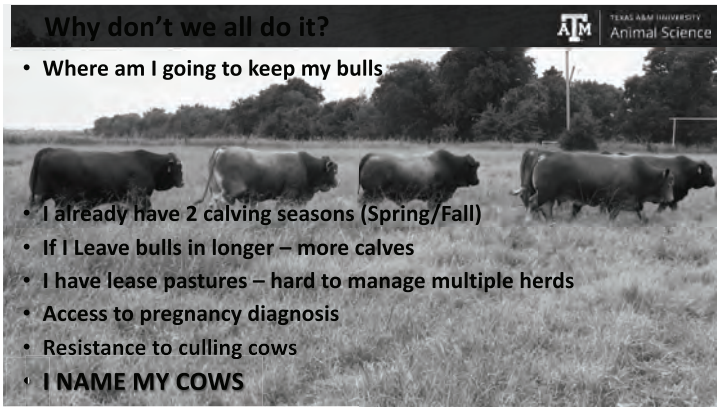
	Relative Economic Importance	Heritability
Reproduction	10	10%
Production	2	20%
Product	1	30%

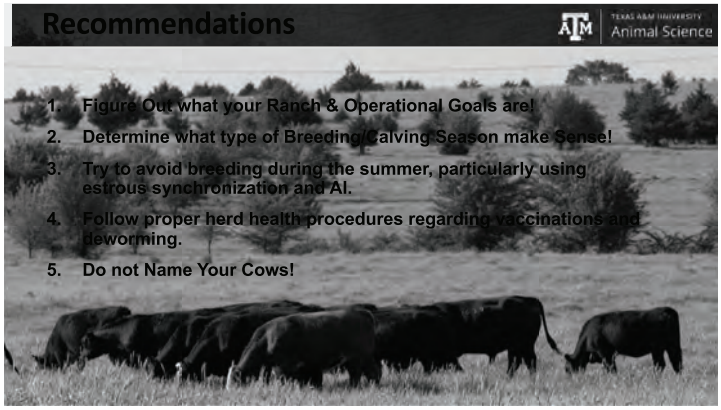
(Source: Willham, 1991

What's Important

- Reproduction:
  - Economic Importance - ⇧
  - Heritability - ⇩
- How can we control reproductive performance?
  - 10% is controlled by ***heritability***
  - 90% is controlled by ***environment and management***

    Phenotype = Genetics + (Environment + Management)
- Environment and Management is what we must control for!!!





Long-Term and/or Big Picture

Cull! Open! Cows!

AgriLIFE EXTENSION
Texas A&M System

B-1443
6/07

Long Calving Seasons: Problems and Solutions

Bruce Carpenter and L.R. Sprott*

"A cow should have a calf every year." That is a very straight forward and simple statement, but cattlemen know it takes effort, planning and management to make this happen.

One way to achieve this goal is to establish well-defined breeding and calving seasons. When the calving season is too long, management is more difficult and many cows will not calve every year. Shorter, controlled calving seasons make the bottom line better because both herd management (expenses) and marketing (income) can be better controlled.

Controlled calving seasons have a number of benefits.

- Improved herd fertility (more calves sold)
- More uniform calf crops (better groups sold or retained)
- Heavier weaning weights (more pounds sold)
- The ability to raise more fertile replacement heifers
- More marketing options for calves (uniformity, age/source verification programs, etc.)
- The ability to target the herd's nutritional and health needs, which may reduce total feed costs

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Problems with Long Calving Seasons

The main reasons to shorten the calving season are to increase the chances that all cows and heifers will calve each year and to increase the weaning weights of their calves.

Length of Gestation and Post-partum Anestrous

Cows are pregnant for about 285 days of a 365-day period. There is not much time left during a year for physiological processes such as calving, uterine repair (involution), and resumption of estrous cyclicity. If cows are to maintain a 12-month calving interval, the calving season can be no longer than 80 days per year (365- 285 = 80). Thus, a calving season of 80 days would necessarily be followed by a breeding season of 80 days (Fig. 1). This 80-day breeding period is **the** window of opportunity for the whole year. The goal of all herd management during the year is to have cows and heifers that are receptive to breeding during this 80-day period. This is why cows that calve early are the most fertile and profitable individuals in the herd, whereas late calvers are the least fertile and profitable (Table 1).

Because delivering a calf is a physiologically stressful process, cows and heifers do not have estrous cycles for a period of time after

FIGURE 1. Length of the calving and breeding seasons and the effect of the earliness of calving on readiness to re-breed.

TABLE 1. Lifetime return on investment per female as affected by earliness of calving as a 2-year-old.

	Calving in:			
	1st 21 days	2nd 21 days	3rd 21 days	4th 21 days
Herd 1	14.8%	10.4%	4.7%	8.6%
Herd 2	(-3.2%)	(-10.3%)	(-12.4%)	(-11.2%)
Herd 3	9%	(-13%)	(-16%)	(-9%)
Herd 4	18%	9%	3.6%	(-10%)
Herd 5	14.7%	2%	6%	6%

Data taken from five commercial herds made up of approximately 1,500 cows that calved annually throughout their lives.
From L.R. Sprott

calving. This is known as the *post-partum anestrous period*. The internal reproductive organs require an absolute minimum of 35 days to repair themselves so that 1) the uterus is capable of maintaining a new pregnancy and 2) estrous cyclicity will commence. In reality, this post-partum anestrous period is closer to 45 to 50 days for most cows. It is greatly influenced by the pre-partum nutrition and body condition of the dam at the time of calving. The post-partum anestrous period may extend to 3 or 4 months—or more—for cows that calve in extremely poor body condition. Obviously, this would make a 12-month calving interval impossible to achieve.

Cows that calve in good body condition, and do so early in the calving season, have the best chance of resuming estrous cyclicity **before** the breeding season begins (i.e., they are "ready to go" when the bulls are turned in). Even in herds with 80-day calving seasons, late calvers are still at a relative disadvantage. Early calvers have the best chance of re-breeding because 1) they have more time to recover and 2) they have potentially more estrus periods—or opportunities to breed. Figure 2 shows the effect of extending a breeding/calving season beyond 80 days. Note that with the 120-day example shown, cows calving in the fourth 30-day period will not be calved out even after the breeding season has begun.

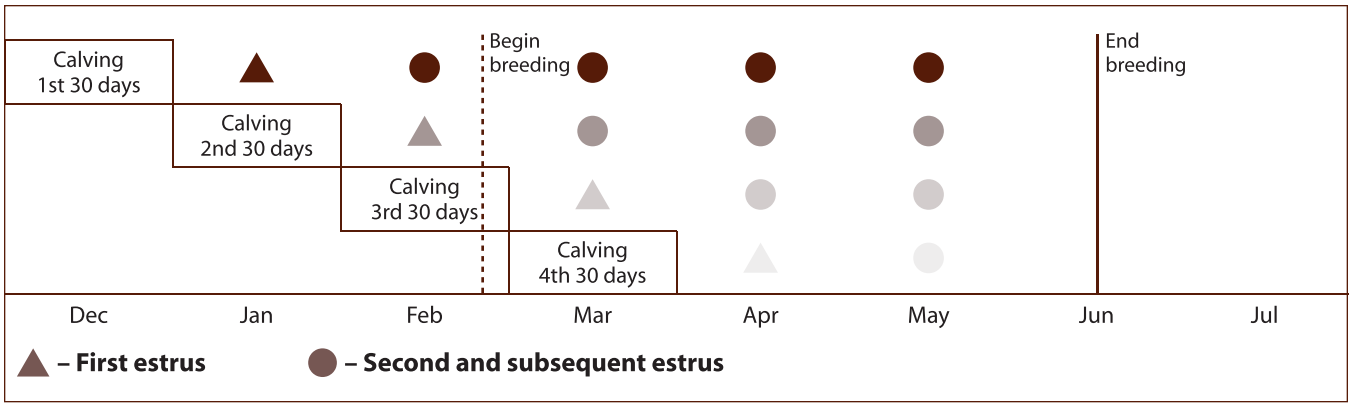


FIGURE 2. The effect of calving time on the number of potential estrous periods and the effect of a 120-day breeding season on late-calving cows.

Light weaning weights

Calves born late in the calving season have lighter weaning weights because they are younger and smaller at weaning. Shortening the calving season greatly reduces age variability and makes calf crops more uniform. This is shown in both Table 2 and Figure 3.

TABLE 2. Effect of time of birth in relation to the start of calving on weaning weight and average daily gain (ADG) in a 120-day calving season.

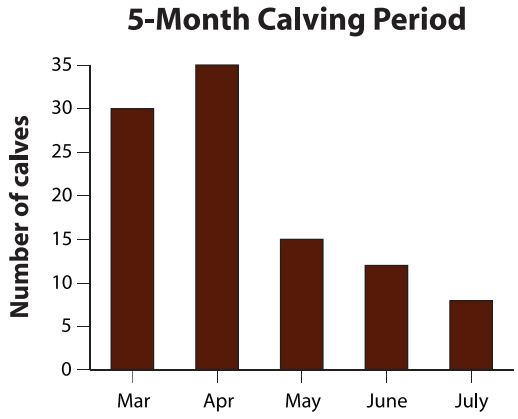
Time of birth by 20-day intervals	Number of calves	Weaning weight	ADG (lb)
First 20 days	77	443	1.76
Second 20 days	264	432	1.75
Third 20 days	244	432	1.78
Fourth 20 days	138	409	1.77
Fifth 20 days	65	405	1.67
Sixth 20 days	16	375	1.59

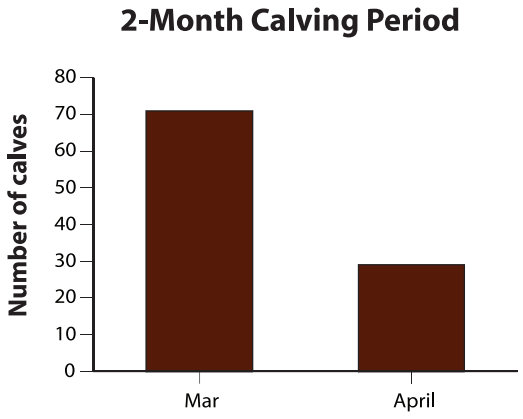
J.L. Lesmeister, P.J. Burfening and R.L. Blackwell. 1973. Date of first calving in beef cows and subsequent calf production. *Journal of Animal Science* 33:1-6.

Managing the Calving Season

Pre-partum nutrition

Most cows lose some weight during calving and lactation. In spite of that, those in good body condition (high body condition score, or BCS) can lose some weight and still re-breed, provided the weight loss is not more than ½ pound per day. Animals without adequate fat cover will still provide milk, but they may not re-breed, especially if they are in poor body condition **and** are late calvers as well. Therefore, one of the most critical things a manager can do is to ensure that cows calve in a BCS of at least 5 or 6 and that weight loss after calving is not dramatic. Managers should evaluate cattle for body condition score 2 to 4 months before the calving season begins. Then there will be time to determine the type and quantity of supplemental feed needed and time for the cattle to respond to supplementation with improved body condition.





Age of calves at weaning	8	7	6	5	4	8	7
Weight of calves at weaning*	560	500	440	380	320	560	500
Total pounds weaned			**48,020**			**54,260**	
Average weaning weight			**480**			**542**	

**Assumes 80-pound birth weight and 2 pounds per day gain.*

FIGURE 3. Effect of length of calving period on total and average pounds of calves weaned in a 100-cow herd.

Supplementing cows to obtain body condition scores higher than 6 is not usually desirable, either from an economic or physiological standpoint, although if they achieve higher levels of condition from a high-quality forage diet, fertility usually is not reduced.

BCS/calving time	Risk of re-breeding failure
BCS 5-6, early calver	low risk
BCS 5-6, late calver	low to moderate risk, depending on nutrition level post-partum
BCS 4, early calver	moderate risk, depending on nutrition level post-partum
BC 4 or less, late calver	high risk
BCS 1, 2, 3	high risk

Nutrient management

Nutrient requirements vary widely throughout the year. For example, at lactation, protein requirements are double what they were earlier in the year. The challenge is that nutrients, either from forage or supplement, are delivered to a herd and not to individual animals. In other words, all cows in the pasture get the same opportunity to consume feed and forage and all are fed in the same way. Supplementation is much more effective in herds with managed calving seasons because all animals are at or near a similar stage of production and have very similar nutrient requirements. Thus, supplemental feed can be accurately and effectively delivered. Managed calving seasons make it easier to time the breeding period, when nutrient requirements are greatest, to coincide with the period of best seasonal forage quality. For example, if March, April and May are the months when green, growing forage is most likely to be available, then the breeding season should coincide with those months. That means calving should occur in December, January and February.

Herd health management

Many vaccinations are best administered at specific stages of production so that the maximum immune response can be realized. With controlled breeding seasons, all cows can be worked and vaccinated at the same time and will achieve the desired level of immunity when it is needed. Their calves, which will be of similar ages, also can be worked together and vaccinated in a timely manner.

Fertility management

Non-pregnant (open) and sub-fertile cattle should be identified and culled to improve herd fertility. Failure to do this will eliminate the possibility of having high pregnancy rates, regardless of how long the breeding period may last. When there is a defined bull removal date, pregnancy testing can be done to find and cull cows that fail to get pregnant. But with year-round or extended breeding/calving periods, sub-fertile cattle often go unrecognized. They may have calves, but no one really knows how often. A defined bull removal date (calving season) forces the culling of sub-fertile cows because they will either calve late, or not at all.

Choosing a calving season

It is generally best to breed when forage quality is best. Across most of Texas this usually means spring breeding (with winter or early spring calving). Sometimes winter breeding (with fall calving) is desirable if cool-season forages are available and/or it is cost-effective to market fall-born calves. If calving occurs in the fall without adequate cool-season forage (or high-quality hay), supplemental feed costs will be high. Breeding cows in the summer is not recommended in most regions of Texas because heat stress lowers the fertility of both cows and bulls. Exceptions to this rule may be found in certain areas of Far West Texas or the Panhandle, or for producers whose markets dictate that calves be born at a certain time of year (for example, if they are producing club calves).

Common Questions about Calving Seasons

The answers to these common questions reveal solutions to the problem of long calving seasons.

Where do I put the bulls to control their access to cows?

Even on large ranches this can sometimes be a problem. Bulls inevitably get out when or where they are not wanted. On smaller acreage this can be a more frequent problem because there may be only one or two bulls and they may even have visual contact with cows from their assigned bull pasture. Good fencing in the bull pasture (at least 5 feet high) is the first step. Fencing may even need to be reinforced with an electric fence, offset to the inside. It may help to train bulls to electric fence in a corral before turning them into the pasture. If there is simply no place to put bulls, it is possible to keep bulls with cows year-round and still have a controlled calving season. This is done by using rectal palpation to find open cows and to evaluate the age of the fetuses in pregnant cows. Cows or heifers that are determined to be pregnant but have fetuses younger than a pre-determined age are culled just as if they were open. This approach requires the services of a person who is skilled in rectal palpation. It also requires that the manager have the self-discipline to cull some pregnant cows and heifers.

CAUTION: If bulls are left with the herd year-round, heifer calves that mature at an early age (7 to 9 months) may have untimely conceptions if they are not protected from the bulls. Such heifers could have serious calving problems, or even die.

Can't I just leave the bulls out a little bit longer this year and get a few more cows bred?

Yes, but those late-bred cows will not fit in with the rest of the herd and breeding seasons in subsequent years would have to be extended to accommodate those individuals (unless they are culled and sold as bred females). If late breeders are allowed back in the main herd, what once may have been an 80- to 90-day calving/breeding season could be extended to 4, 5, 6 months or more. This would mean that many cows would not be calving on a true 12-month interval (see Figure 1) and might be calving at an undesirable time of year.

What can I do to begin a controlled calving season, or shorten the one I have now?

The first step is to determine the best time to calve and what percentage of the herd is calving outside of the desired months. This can be done by recording calving dates for individual cows or by rectal palpation. Most cattle naturally breed at the time of year when nutrition is best, so getting the herd on a controlled schedule is often just a matter of culling a few animals—those calving at the wrong time and those that do not calve consistently. Pregnancy rates will never be high if inconsistent calvers are left in the herd. *The key is to replace culls with heifers or cows that are bred to calve slightly before, or near the start of, the desired calving period.*

If a large percentage of the herd is calving in undesirable months, there may be two options. One option is to slowly tighten the breeding season over a period of 3 to 4 years, replacing culls with heifers or cows bred to calve before or near the start of the desired period. The second option is to split the herd into two herds (typically spring and fall calvers) and add replacement animals to only one herd. Attrition will eventually take care of the herd that is calving at the undesired time.

Can I change a late-calving cow into an early calver?

Not very easily. Late calvers tend to remain that way even with good nutrition, because as Figure 2 shows, after accounting for the length of gestation, there simply isn't enough time to "back them up" in the calving season. However, early calvers will remain early calvers as long

as they are properly managed. But if management falters, even early calvers can cycle late and become late calvers, with little chance of ever returning to their previous schedule. Estrus synchronization can be used to move late calvers to an earlier calving date. However, this should be done only on fertile females that have calved consistently every year. Another option is to use some form of temporary calf removal to stimulate an earlier return to estrus after calving.

Summary

Beef cows and heifers are managed not as individuals, but in herds. So effective herd management (feeding, culling, selection, etc.) depends on having animals that are in similar stages of production. Controlled calving and breeding seasons facilitate good management. The most productive individuals are those that calve early. This allows re-breeding to occur early, increases the animals' lifetime fertility, and ensures that calves will be older and heavier at weaning.

There are more options for marketing calves when the calf crop is fairly uniform. Many age/source verification markets now require documentation of how calving seasons are managed.

For more information refer to these Texas Cooperative Extension publications, available at *http://tcebookstore.org*:

B-1526, *Body Condition, Nutrition and Reproduction of Beef Cattle*
L-5443, *Calf Removal: A Way to Stimulate Reproduction in Cows*
B-6123, *Synchronizing Estrus*

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Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Edward G. Smith, Director, Texas AgriLife Extension Service, The Texas A&M University System.
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Choosing the Time of Year to Breed and Calve Beef Cows in Texas

L.R. Sprott*

As any cattleman knows, the time of year when cows calve directly affects many herd management practices:

- The start of calving is dictated by the start of breeding.
- Cows calving in the fall normally need more supplemental feed in the winter, unless cool season pastures are used, than do cows that calve in the spring.
- Fall-born calves will be marketed in the spring and calves born in the spring will be marketed in the fall unless the producer can retain ownership of calves past weaning.

These few differences in management indicate that a producer should give careful consideration to the time of year in which to calve cows. The decision of when to calve is complicated by numerous factors and, in many instances, inattention to details can dramatically affect costs of production, animal performance, income and profitability.

Things to Consider

The first thing to realize is that there is no single date that is best for the start of calving. However, there are breeding and calving dates that probably should be avoided because differences in climate in regions of Texas can affect the availability and conditions of pasture needed for nutrition of pregnant cows and calves.

There are a few principles about fertility in cows that a producer should consider in deciding when to breed and calve the herd.

Principle 1—Regardless of management influences, fertility among cows is variable. Table 1 shows that fertility is highest in cows that conceive at first service, and it is clear that cows requiring more than two services during the breeding period are the least fertile in the herd.

Principle 2—It is important to properly feed cows so that they can show estrus early in the breeding period. Table 2 shows that cows that display estrus within the first 21 days of breeding have higher pregnancy rates compared to cows displaying estrus after the first 21 days of breeding. Consequently, pregnancy rates are high in herds that have a high proportion of cows showing estrus early in the breeding period.

Principle 3—Most of the pregnancies within a herd occur in the cows with highest fertility. Table 3 shows that 95 percent (Trial 1) to 97 percent (Trial 2) of all pregnancies are attributed to cows conceiving at their

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first or second estrus. Only 3 percent (Trial 2) to 5 percent (Trial 1) of pregnancies are attributed to cows that conceive at their third estrus.

Consider these principles regarding cow fertility in deciding when to start breeding. It could increase the chances that the most fertile cows will conceive and ensure high pregnancy rates.

Table 1. Pregnancy rate in cows requiring multiple services.

Number of services	Number of cows	Pregnancy rate
One	220	77.3%[a]
Two	28	35.7%[b]
More than two	67	16.4%[c]

[a,b,c]P < .005, Sprott et al., 1998, PAS 14:231

Table 2. Pregnancy rate in cows showing estrus early in the breeding period.

Number of cows	Time of estrus	Pregnancy rate
220	First 21 days	81.8%[a]
65	After first 21 days	58.5%[b]

[a,b]P < .005, Sprott et al., 1998, PAS 14:231

Table 3. Cows generating the most pregnancies in the herd.

			Percent (%) of all pregnancies occurring at:		
Trial	Number of cows	Number pregnant	1st estrus	2nd estrus	3rd estrus
1	285	229	208/229 (91)	10/229 (4)	11/229 (5)
2	251	216	177/216 (82)	33/216 (15)	6/216 (3)

Trial 1 - Sprott et al., 1998, PAS 14:231
Trial 2 - Sprott, 1999 (unpublished)

Fertility in Summer Months

Temperature and humidity during certain months are stressful and can reduce fertility. Table 4 shows that if cows exhibit their first estrus after the month of May in Central Texas (Trial 1) or April in the Gulf Coast region (Trial 2), the chances of conceiving are dramatically reduced.

Results, at either location, showed pregnancy rates were less than 17 percent in cows displaying their first estrus during July through September. That indicates that summer breeding in these two regions of Texas is not recommended.

Research has shown that this reduction in fertility is a result of heat stress brought on by high temperature and humidity that combine to raise the temperature/humidity index. Heat stress in cows is known to cause hormone imbalances, reduced quality of ova, early embryo death and reduced blood flow to the uterus. These factors, either singly or in combination, result in low fertility. Likewise, bulls also are affected by heat stress that causes sperm cell quality to decline. As a result, when heat stress occurs, its negative effects on fertility in both the cows and bulls reduces the chance of pregnancy.

Similar studies have not been conducted in other areas of Texas, but it appears that late summer rains and low humidity in areas of West Texas allow producers in that region to breed their cows during summer months without experiencing major reductions in fertility. In contrast, high humidity in eastern, southeastern and Gulf Coast regions of Texas suggests that summer breeding may not be advisable.

Fertility in Winter Months

Unfortunately, data concerning pregnancy rate at first estrus during the cold months in Texas are not available. However, Table 5 shows that Central Texas cows exposed for breeding during November, December and January have acceptable reproductive performance. Note that the lower pregnancy rates in Herd 1 (1989,1990) and Herd 2 (1988, 1989) were attributed to nutritional problems. Pregnancy rates improved when the herd owners corrected their management practices. If nothing else, data in Table 5 indicate that proper nutrition is required and that temperatures during Central Texas winters are not so stressful that fertility is compromised.

Table 4. Fertility at first estrus during spring breeding as affected by month (Texas).

	Pregnancy rate (%) by month				
Trial	April	May	June	July	July - September
1	——	180/220(81.8)	38/65(58.4)	11/67(16.4)	——
2	31/41(75.7)	13/29(44.8)	10/22(45.4)	——	3/19(15.8)

Trial 1 - Sprott, et al., 1998, PAS 14:231; May vs June, P < .005, June vs July, P < .005 (number of cows - 285);
Trial 2 - Sprott, 1999 (unpublished, Brazoria County, TX), P < .005 (number of cows -111)

Table 5. Pregnancy rates (%) in central Texas cows bred in the fall (Nov., Dec., Jan.).

	Year					
	1988	1989	1990	1991	1992	1993
Herd 1 (Fayette County)	—	74	76	86	94	93
Herd 2 (Hays County)	87	83	92	91	—	—

Herd 1 - 107 cows
Herd 2 - 35 cows

Calf Performance as Affected by Month of Birth

Table 6 shows the effect of month of birth on calf performance. These data were taken from more than 8,000 calves born in the central, southern and Gulf Coast regions of Texas. In general, the information can be applied to herds in the eastern, southeastern, south central and southern regions of Texas.

The data show that growth performance drops in calves born in May through September. Calves born in those months had adjusted weaning weights (to remove age bias) below that of calves born in cooler months. Peak performance occurred in calves born in March (Trails 1 and 2) or April (Trial 3) and declined for all calves born from May through September by as much as 56 (Trial 1), 79 (Trial 2), and 124 (Trial 3) pounds. The information presented in Table 6 should not be used to target a specific month to calve because there is some variation in the data between locations.

It can be concluded that high temperatures are very stressful on summer-born calves and will reduce their growth. Unless a producer retains ownership of summer-born calves to feed through the winter, the calves are unlikely to generate acceptable income. Even then, data from a fourth Gulf Coast herd with summer calves (not shown) revealed that growth rate in summer calves was low, which forced them to be kept until 12 months of age to reach an acceptable sale weight that their herd mates reached at 7 months of age.

If calves born in cooler months perform better than those born in summer, then what effect is there on performance of calves born in the cold of December, January and February? Table 6 shows that calves born in those months also suffer, but not to the same degree as those born in hot months. Cold may negatively affect calf performance, but the degree of cold stress in central, southern and the Gulf Coast regions of Texas is not high enough to eliminate calving in the fall and winter.

This is completely contrary to the effects of cold on performance in winter-born calves in northern states where temperatures are more severe and high death loss and the potential for low growth rate in calves are major concerns. Perhaps the most important thing to conclude from data in Table 6 is that stressful temperatures of both cold and heat will affect calf performance, and summer calving is not recommended in the eastern, central, southern and Gulf Coast regions of Texas.

Effects of Cow Size on Choosing When to Calf

Cow size is an important consideration in choosing when to calve. Data from an Arkansas trial show that calf performance and profits are best in small to medium frame cows that calve in the fall compared to spring months. Even though feed costs increased for these fall-calving cows compared to those calving in spring, the value of higher performance in their calves justified the higher feed costs and resulted in higher profits.

To the contrary, large frame cows that calved in the spring had higher profits than when calved in the fall. The reason was that supplemental feed requirements for the fall-calving cows were so high that the value of performance in their calves did not justify the high feed costs. These data suggest that unless alternative nutritional management steps can be taken to reduce feed costs in large frame, fall calving cows, it is best to calve such cows in the spring.

Table 6. Effect of month of birth on adjusted weaning weight in calves.

	Month of Birth											
Trial	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	388	427	430	417	416	—	—	374	424	—	478	465
2	477	491	477	467	432	424	434	414	398	432	447	474
3	361	394	415 438	396	—	341	314	320	349	359	357	

Trail 1 - Burleson County, 1976
Trial 2 - Webb County, circa 1969
Trail 3 - Calhoun County, 1976-1979

Conclusions

The data presented do not clearly identify a specific month to calve and breed cows in Texas, but there is no question that summer calving (May through September) in the eastern, central, southern and the Gulf Coast regions of Texas will result in significantly reduced calf performance. A drop in calf performance ranging from 56 to 124 pounds (Table 6) in summer-born calves probably is not economically acceptable to a producer.

In six other Texas trials, management steps to eliminate summer-born calves and concentrate the calving season in the cooler months of spring or fall resulted in an average 74 percent increase (range of 27 percent to 150 percent) in production.

It also is clear that fertility in cows bred in July though September (Table 4) drops. Depending on location, cows (Texas Gulf Coast region) bred in May and June had pregnancy rates approximately 30 points below those bred in cooler months, while cows in the central and Gulf Coast regions bred from July through September had pregnancy rates from 60 to 65 points below cows bred in cooler months.

The lack of data on calf performance and fertility for cows in West and North Texas prevents any statement about the appropriate months to calve and breed in those regions. But summer breeding and summer calving in eastern, central, southern and the Gulf Coast regions of Texas is not recommended.

Acknowledgment

The author expresses his thanks to Dr. Tom Troxel, Cooperative Extension Service, University of Arkansas, for supplying data on cow size.

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Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Edward G. Smith, Director, Texas AgriLife Extension Service, The Texas A&M University System.
Revision