Reproductive Management

Southern Section ASAS Webinar Series
September 15th, 2016
Justin Rhinehart UT Animal Science
Measuring reproduction?

- Pregnancy rate
- Percentage calf crop
- Pounds of calf weaned per cow exposed

\[ = \frac{\text{Total WW}}{\text{Total # of Cows}} \]

- Accounts for
  - Reproductive efficiency (pregnancy rate)
  - Calving percentage
  - Weaning rate
  - Growth genetics and management
<table>
<thead>
<tr>
<th>% Calf Crop</th>
<th>Avg. WW</th>
<th>Lbs./Cow</th>
<th>$ / Cow</th>
<th>Diff.</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>500</td>
<td>500</td>
<td>$650</td>
<td>$65</td>
</tr>
<tr>
<td>90</td>
<td>500</td>
<td>450</td>
<td>$585</td>
<td>---</td>
</tr>
<tr>
<td>80</td>
<td>500</td>
<td>400</td>
<td>$520</td>
<td>$65</td>
</tr>
<tr>
<td>70</td>
<td>500</td>
<td>350</td>
<td>$455</td>
<td>$130</td>
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</tbody>
</table>
Reproductive Goals

- 90 to 95% in heat the first 21 days of the breeding season.
- 70% conceive on first breeding.
- Less than 5% difficult calving.
- 90% of cows bred and wean a calf.
Cost of Missing One Estrous Cycle?

Estrous Cycle length: 21 days

Estimate weight/day of age: 2 lbs

Market price (500 lbs): $1.50/lb

21 days X 2 lbs = 42 pounds

42 lbs X $1.50 = $63.00
Reproductive System of the Cow

Senger, 2003
Sperm Production

Sengen, 2003
Anestrus
Anestrus – Pubertal & Postpartum

Postpartum Progesterone

P4 (NG/ML)

DAYS POSTPARTUM

Estrus
Factors That Control Puberty

• **Age**
  – Minimum age needs to be reached before heifers will start to cycle
  – Average age = 12 – 24 months

• **Weight**
  – Long-held rule of thumb, 65 – 70% of their mature weight prior to the breeding season
    • “Target Weight”

• **Breed or breed type**
Factors That Control Postpartum Anestrous

- Nutrition (BCS)
- Age (Parity)
- Days PP
- Presence of Calf
- Genetics
- Calving Difficulty
- Health
FACTORS AFFECTING REPRODUCTION
Nutrition

Body Condition Score (BCS)
Nutrition

Forage Type
Nutrition

• Mineral Status & Performance

Wikse, 1992
Health

Diagram showing the relationship between health status and factors such as immunity, growth/fertility, and clinical signs.

Status: Healthy, Subclinical, Clinical
Temperament

Cooke et al., 2010
Season Effects on Fertility

- Increased numbers of follicles and larger follicle size in spring than fall (Lammoglia et al., 1996)
- Lower fertility rates during late fall and winter in Bos indicus cows (Randel, 1984)
- Lower serum progesterone concentrations and abnormal estrous cycle lengths in Brahman heifers during winter months (Stahringer et al., 1990)
- Summer heat stress
# Crossbreeding

<table>
<thead>
<tr>
<th>Trait</th>
<th>Heritability</th>
<th>Heterosis</th>
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</thead>
<tbody>
<tr>
<td>Reproduction</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Growth</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Carcass</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>
HOW CAN WE IMPROVE REPRODUCTION?
Calving Season Management
Controlled Breeding Season

• Concentrates management

• Easier to identify dystocia
  – Reduce calf (and maybe cow) loss due to calving difficulties

• Can focus on other management issues after calving season is over

• Calf crop will be similar in age and weight
  – Increased revenue from marketing uniform calves
  – Makes heifer development realistic
## Calving Distribution

<table>
<thead>
<tr>
<th>Example</th>
<th>First Cycle</th>
<th>Second Cycle</th>
<th>Third Cycle</th>
<th>Preg. Rate</th>
<th>Avg. DPP Next Season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example 1</td>
<td>30%</td>
<td>30%</td>
<td>30%</td>
<td>90%</td>
<td>39</td>
</tr>
<tr>
<td>Example 2</td>
<td>10%</td>
<td>20%</td>
<td>60%</td>
<td>90%</td>
<td>27</td>
</tr>
<tr>
<td>Example 3</td>
<td>60%</td>
<td>20%</td>
<td>10%</td>
<td>90%</td>
<td>51</td>
</tr>
</tbody>
</table>
Reproductive Cycle – 60 d Breeding Season

- **Calving Season**
  - 45 days
  - 60 days
  - 90 days
- **Anestrous Period (PPI)**
- **Breeding Season**

Months:
- Mar
- Apr
- May
- June
- July
- Aug
- Sept
- Oct
- Nov
- Dec
- Jan
- Feb
- Mar
- Apr
- May
- June
- July
- Aug
- Sept

Gestating Cows
Breeding Soundness Exam

- A BSE is a systematic veterinary examination of the bull resulting in a prediction of his potential fertility.
Cull Open Cows
Select for Docility

- Temperament is moderately heritable
- Retain and buy heifers from docile cows
- Use docile bulls
- Docility EPDs
Heterosis for lbs. Calf/Cow

- Individual Heterosis
- Maternal Heterosis
- Individual + Maternal

% Heterosis

Real. Life. Solutions.
Steps in Heifer Development

• 1 month before breeding season
  – Vaccinate against Vibrio, Lepto, and respiratory/reproductive disease complex (IBR, BVD, etc.).
  – Develop synchronization system (use some type of progestagen)
Steps in Heifer Development

• Post – breeding
  – Pregnancy check
  – Cull open and late-bred heifers until replacement number is reached
Purchased Replacements

Breed “C” Bull

C × AB Calves

AB Cross Females

Replacement Females (AB) Purchased

Market
Anestrus – Pubertal & Postpartum

Postpartum Progesterone

MGA
CIDR
GnRH

DAYS POSTPARTUM

P4 (NG/ML)
ES for Natural Service

MGA or CIDR
7 Days

Turn in Bulls

Saturday

Saturday
## ES for Natural Service

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Numbers</th>
<th>Preg. Rate</th>
<th>1&lt;sup&gt;st&lt;/sup&gt; 30 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>621</td>
<td>83</td>
<td>47</td>
</tr>
<tr>
<td>MGA</td>
<td>614</td>
<td>93</td>
<td>78</td>
</tr>
<tr>
<td>Control</td>
<td>419</td>
<td>83</td>
<td>45</td>
</tr>
<tr>
<td>CIDR</td>
<td>421</td>
<td>91</td>
<td>80</td>
</tr>
</tbody>
</table>

Bull:Cow range from 1:23 to 1:42 (91% Preg PR)
Adv. Reproductive Technologies

- Artificial insemination
- Estrus Synchronization
- Embryo transfer
- In-vitro fertilization
Cattle Prices

Current Week Prices

<table>
<thead>
<tr>
<th>Date</th>
<th>Open</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov, 22</td>
<td>$172.40</td>
<td>$173.98</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Settle</td>
</tr>
<tr>
<td></td>
<td>$171.93</td>
<td>$173.48</td>
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</tbody>
</table>

Change from Previous Week

<table>
<thead>
<tr>
<th>Date</th>
<th>Open</th>
<th>High</th>
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</thead>
<tbody>
<tr>
<td>Nov, 22</td>
<td>($3.15)</td>
<td>($2.03)</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>Settle</td>
</tr>
<tr>
<td></td>
<td>($0.10)</td>
<td>($1.60)</td>
</tr>
</tbody>
</table>

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NEW Contest: What are you thankful for?

Wed, 18 Nov

With Thanksgiving just around the corner, we are showing our thanks by giving away three western art prints. Get all the...

Read More...

Start now to prepare for calving season

Tue, 17 Nov

It’s the end of the year and that means countdowns as people look back at the year that was and look ahead a the year to...

Read More...

New Chaney twins book raises money for A...

Tue, 17 Nov

Christmas is just around the corner; do you have any ideas for your kids? Check out “It’s All About That Beef!” by

Real. Life. Solutions.”
Take-Home Message

• Reproduction is the key to making money in cow-calf production
  – Approach it as producing a commodity “crop”

• Many factors influence reproduction
  – Those factors can be managed

• Technology for reproductive management is rapidly advancing