Heifer Management to Make Successful Cows

Florida Beef Cattle Short Course
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Reasoning

- Developmental period
  - Period from weaning to first calving
  - Influences lifetime productivity and longevity

- Properly developed heifers:
  - Calve early in the first calving season
  - Calve early in subsequent calving seasons
  - Wean heavier calves
  - Remain in the cow herd longer
# Timeline of Heifer Development

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sixty day breeding season</td>
<td>60</td>
</tr>
<tr>
<td>Gestation period for brood cow</td>
<td>285</td>
</tr>
<tr>
<td>Birth to weaning</td>
<td>210</td>
</tr>
<tr>
<td>Weaning to breeding</td>
<td>240</td>
</tr>
<tr>
<td>Gestation period for heifer</td>
<td>280</td>
</tr>
<tr>
<td>Calving until re-breeding</td>
<td>80</td>
</tr>
<tr>
<td>Rebreeding until pregnancy exam</td>
<td>45</td>
</tr>
<tr>
<td><strong>Total time in days</strong></td>
<td>1200 Days</td>
</tr>
<tr>
<td><strong>Total time in months</strong></td>
<td>40 Months (3+ Years)</td>
</tr>
</tbody>
</table>
# How much does a replacement cost?

<table>
<thead>
<tr>
<th></th>
<th>Retained</th>
<th>Purchased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deferred Revenue*</td>
<td>$1,260</td>
<td>-----</td>
</tr>
<tr>
<td>Development†</td>
<td>$450</td>
<td>-----</td>
</tr>
<tr>
<td>Opportunity Cost‡</td>
<td>$270</td>
<td>-----</td>
</tr>
<tr>
<td>Purchase PriceΔ</td>
<td>-----</td>
<td>$2,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,980</strong></td>
<td><strong>$2,000</strong></td>
</tr>
</tbody>
</table>

* 700 pound heifer at $180/cwt.
† Includes nutrition, breeding, labor and death loss.
‡ Revenue lost from running three fewer cows with the recourses that used to develop five heifers.
Δ Estimated average purchase price for heavy-bread, superior genetic replacements in 2012.
Objectives

- Breed early in the first breeding season
- Minimize calving difficulties
- Wean acceptable calves
- Breed early in the second breeding season
- Minimize overall cost
- Optimize profit
- Improve genetics
Decisions

- Cow/Calf Producer
  - Retained or Purchased
  - Custom or Home Development

- Stocker Operator
  - Steers, Heifers or Cows
  - Owned or Contract Development
<table>
<thead>
<tr>
<th>Ages</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weaning</td>
<td>Reproductive success</td>
</tr>
<tr>
<td>Yearling</td>
<td>Records</td>
</tr>
<tr>
<td>Post-breeding</td>
<td>• Pedigrees and EPDs</td>
</tr>
<tr>
<td></td>
<td>• Phenotypic characteristics</td>
</tr>
<tr>
<td></td>
<td>• Skeletal structure</td>
</tr>
<tr>
<td></td>
<td>• Performance</td>
</tr>
</tbody>
</table>
Genetic Selection

- Expected Progeny Differences (EPDs)

- Performance records
  - Dam and sire
  - Sibs and half-sibs
  - Weaning weights, yearling weights, feedlot and carcass
Select for Docility

• Temperament is moderately heritable
• Retain and buy heifers from docile cows
• Use docile bulls
• Docility EPDs
# Response of a trait to heterosis

<table>
<thead>
<tr>
<th>Trait</th>
<th>Heritability</th>
<th>Heterosis</th>
</tr>
</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>
Heterosis for lbs. Calf/Cow

% Heterosis

0 5 10 15 20 25

Individual Heterosis
Maternal Heterosis
Individual + Maternal

Heterosis for lbs. Calf/Cow

% Heterosis

0 5 10 15 20 25

Individual Heterosis
Maternal Heterosis
Individual + Maternal
Purchased Replacements

Breed “C” Bull

C × AB Calves

Market

AB Cross Females

Replacement Females (AB) Purchased
Steps in Heifer Development

- At weaning or purchase
  - Select oldest and heaviest heifers
    - Consider frame score and mature cow size
  - Select more than you need as replacements
  - Set target weight = 67% of mature cow weight
  - Set breeding date
Steps in Heifer Development

- Fertility increases with each estrous cycle after puberty
- Up to about 80%
Steps in Heifer Development

- Decide on growth pattern
- Develop ration(s) to gain appropriate weight
- Weigh heifers to ensure weight gain is on target
- Use body condition scoring (BCS)
Growth Pattern

Days Post-Weaning

Weight (Kg)

Steady
Early
Late
New Concepts in Nutritional Development

• Genetic improvement has advanced the age at puberty
  – The 60% target weight might now be out of date
  – Can reduce input cost of purchased feed

• Intensive management systems might maximize pregnancy rates but do not optimize profitability
# Fetal Programming

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<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Steers</td>
<td>528</td>
<td>483</td>
<td>516</td>
<td>533</td>
</tr>
<tr>
<td>Weaning Wt. (lb)</td>
<td>825</td>
<td>789</td>
<td>820</td>
<td>819</td>
</tr>
<tr>
<td>Carcass Wt. (lb)</td>
<td>82.5</td>
<td>77.8</td>
<td>86.8</td>
<td>64.4</td>
</tr>
<tr>
<td>Quality Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heifers</td>
<td>478</td>
<td>454</td>
<td>479</td>
<td>480</td>
</tr>
<tr>
<td>Weaning Wt. (lb)</td>
<td>352</td>
<td>372</td>
<td>347</td>
<td>360</td>
</tr>
<tr>
<td>Age @ Puberty</td>
<td>90.5</td>
<td>77.1</td>
<td>87.8</td>
<td>83.3</td>
</tr>
<tr>
<td>Preg. Rate (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Funston et al., 2009 *Nebraska Beef Report*
Steps in Heifer Development

• One month before breeding season
  – Perform pelvic area measurements
    • Cull heifers with unacceptable pelvic area
    • What is an unacceptable pelvic area?
Steps in Heifer Development

- One month before breeding season
  - Reproductive tract scores (RTS)
  - Cull heifers that are sexually immature
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)
14-day CIDR®-PG
Perform TAI at 66 ± 2 hr after PG with GnRH at TAI.

0  |  14  | ... 16 d ... |  30  |  33

CIDR®  | PG  |  66 ± 2 hr | AI  | GnRH
5-day CO-Synch + CIDR®
Perform TAI at 72 ± 2 hr after CIDR removal with GnRH at TAI. Two injections of PG 8 ± 2 hr apart are required for this protocol.
Steps in Heifer Development

• Post – breeding
  – Pregnancy check
  – Cull open and late-bred heifers until replacement number is reached
Steps in Heifer Development

- Post-breeding
  - Heifers should weigh approximately 85 to 90% of mature weight at calving
    - Usually results in 1 lbs./day until calving
    - Maintain BCS of 6
  - More critical analysis of selection traits
  - Give special attention during calving
  - Maintain BCS 5 until re-breeding
Scenarios
Cow / Calf

Calf Crop

- Market All
  - Purchase Replacements
  - Develop On-Farm
  - Send to Custom Developer
- Retain Heifers
  - Develop Heifers
- Stocker
  - Market All as Feeders
Custom Developer

- Consignments
  - Yearlings
  - Contract

- Develop
  - Value-added
  - Market open

- Market
  - Return
  - Formal Sale
Stocker Operation

- Purchase Replacement Quality
  - Develop
  - Breed

- Market
  - Bred Replacements
  - Open Feeders
Diversified Stocker

- Purchase Replacement Quality
- Develop
- Breed

- Market
- Bred Replacements
- Open Feeders

- Retain
- Open for finished market
New Producer Entry

- Buy Stocker Heifers
  - Develop
  - Breed

- Market
  - Open feeders
  - Extra Bred

- Retain
  - AI Bred

- Build Cow Herd
  - Stocker Fewer Following Year

Following Year

Build Cow Herd

Stockers Fewer Following Year

Retain

AI Bred

Market

Open feeders

Extra Bred

Buy Stocker Heifers

Develop

Breed
Take-Home Message

- Developing heifers is a “make or break” period for their value as cows.
- There is a tremendous expense associated with developing heifers.
- In all cases, pregnancy check early!!
- Consider diversification and non-traditional methods (both management and business models).