Strategies for Forage-Based Heifer Development

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What is the goal of any replacement heifer development program?
Introduction

• Most expensive segments of cow-calf industry
• Increased productivity when a high % of heifers become pregnant early in the breeding season
• Heifer management should not be over looked
Introduction

- Heifers calving at 2 years have increased lifetime productivity
- Must be bred by 15 months
  - Puberty 1 month prior to breeding
  - Heifers bred 1 month before cows
- Heifers must be pubertal by 11 to 13 months of age
Challenges

• *Bos Indicus* breeding
  – Slower maturing and older at puberty
• Higher nutritional requirements
Challenges

• Forages
  – Lower CP and TDN

• Bahiagrass
  – 8.9% CP and 54% TDN

• Fescue
  – 15% CP and 61% TDN
Forage Quality Determines Performance and Supplementation
<table>
<thead>
<tr>
<th>Gain</th>
<th>Forage #1 CP= 6% TDN= 47%</th>
<th>Forage #2 CP= 9% TDN= 54%</th>
<th>Forage #3 CP= 12% TDN= 58%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supp. (lb)</td>
<td>CP %</td>
<td>Supp. (lb)</td>
</tr>
<tr>
<td>1.0 lb/d</td>
<td>6</td>
<td>13.8</td>
<td>4</td>
</tr>
<tr>
<td>1.5 lb/d</td>
<td>9</td>
<td>13.4</td>
<td>7</td>
</tr>
</tbody>
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Forage Quality

Increasing the quality of forage available to heifers will decrease supplement costs
Forage Quality

- Proper pasture management
- Winter/summer annuals
- Proper hay field management
- Proper hay harvesting
Round Bale Silage
Round Bale Silage

• Allows for timely harvest of forage
  – Forages are stored at peak nutrient value

• Cost of machine and wrap
Round Bale Silage

- Hay only vs. Hay/RBS
  - Hay/RBS had 2 more cuttings
  - 55 tons more dry matter
- Hay only- CP= 10.1% TDN= 53.8%
- Hay/RBS- CP= 12.9% TDN= 57.1%

(Hersom et al., 2007)
Round Bale Silage

• Investment in wrap and wrapper pays for itself in increased forage quality
• Wrapping forage will not improve the quality

Bad Hay is Bad Hay
Alternative Forages

• Rye, Ryegrass, Oats, and Wheat

• Corn or Sorghum Silage
Forage Testing

- Know the nutritive value of the forage
- Test all forages
- Cost is minimal
- Costs recovered in animal performance and supplement savings
Forage Rules

• Always provide heifers the best forage available
  – Increased gains with less supplement
  – Decreased supplement costs
  – Decreased overall costs
Energy Supplements

• Usually the limiting nutrient
• Feed high TDN supplements
• Grains can lower rumen pH
  – Decrease forage digestibility
• By-products have comparable TDN but will not decrease rumen pH
  – Cheaper
Energy Supplements

• Fat supplementation
  – Energy dense
  – Limit to less than 5% DM intake

• Nutritionally challenged heifers may benefit reproductively
Protein Supplements

• Increase intake of low quality forage
• Increased performance from natural protein sources vs. non-protein nitrogen sources (urea)
• Protein is expensive
Minerals

• Feed or allow access to a complete mineral at all times
Management Programs
Management

• Goal
  – Grow heifers to a point where the majority of heifers are pubertal and cycling at the start of the breeding system
Body Weight Changes of the Replacement Heifer

- Uterine Mass, lb
- Shrunken BW, lb

- 65% of mature weight
- 85% of mature weight

- 1200 lb Brangus

Weaning | Breeding | Calving
Target Body Weight

• Heifer #1- mature wt.- 1100 lbs
  – Target weight @ breeding- 715 lbs

• Heifer #2- mature wt.- 1200 lbs
  – Target weight @ breeding- 780 lbs
Target Body Weight

- Weaned September 1
- Breeding starts March 15 (196 d)
- Both heifers weaned @ 500 lbs

- Target BW @ Breeding
  - Heifer #1- 715 lbs (1.10 lb/d)
  - Heifer #2- 780 lbs (1.43 lb/d)
Management

- Choose a program and stick with it
- Ample supply of forage and supplement
- Alterations in diet can drastically effect performance
- If possible, weigh a set of heifers every 2 months to determine ADG
Management

• Always manage heifers separate from the cow herd
  – Different nutrient requirements
  – Body size

• Group heifers by size if possible
Management

• Constant weight gain
  – Most common method
• Heifers supplemented to gain continuously
• Easy
• Effect of supplementation interval?
  – Possibly
Supplement Interval

- Cooke et al. (2007)
- Ona, FL
- *Bos Indicus* cross heifers
- Grazing Bahigrass pasture
- 45 d prior to breeding
- Fed equal amounts of low-starch, high-energy supplement
Supplement Interval

- ADG greater for daily-fed vs. 3-times per week
  - 1.98 vs. 1.60 lb/d
- Age at puberty was less and pregnancy rates were higher for daily-fed heifers
Supplement Interval

• Alachua, Fl
• Angus and Brangus Heifers
• From after weaning to breeding – 6 months
• Access to Bermudagrass RBS
• Fed dried distillers grains
Supplement Interval

- ADG higher than predicted
- Similar for daily-fed and 3-times a week
  - 1.85 and 1.83 lb/d
- Daily-fed heifers had higher puberty rates at breeding
  - 60% vs. 40 %
• However, synchronized pregnancy rates were higher for 3-time a week heifers
  – 57% vs. 43%
Supplement Interval

• Reasons for differences
  – Different supplements
  – Different forages
    • RBS had greater CP and TDN than bahigrass pasture
  – Different durations
Programmed Feeding

- Slower rate of gain in the beginning followed by a faster rate of gain

- Compensatory gain

- Increased feed efficiency

- Decreased supplement cost
Programmed Feeding

• Weekley, 1991
• *Bos Indicus* cross heifers
• Drylot for 5 months
• 2 groups
  – Even- 1.34 lb/d for the trial
  – Low-high- 1.17 lb/d for the first 3 months and 1.63 lb/d for the last 2 months
Programmed Feeding

- Even gain heifers reached puberty 30 d earlier

- However, pregnancy rates were similar between the two groups
Programmed Feeding

- 2 year study
- Angus X Hereford heifers
- Drylot for 6 months
- 2 groups
  - Even- 1.00 lb/d for the trial
  - Low-high- 0.25 lb/d for the first 4 months and 2.0 lb/d for the last 2 months
Programmed Feeding

- At breeding-frame score, BCS, and body weights the same both years
- Age at puberty
  - First year: Similar
  - Second year: Delayed in the low-high heifers by 3 weeks
- Similar pregnancy rates both years
- Low-high heifers more efficient
  - Consumed 12% and 2.5% less feed
Programmed Feeding

• Possible management system for Florida
• No data on grazing/hay systems
• Currently working on this in our lab
Summary

• Greatest investment for producers
• Heifers must be pubertal by 11 to 13 months of age
• Know target body weight of heifers and provide the appropriate level of nutrition to achieve it
Forage Quality Determines Performance and Supplementation
Questions?
Additional Management Tools
Deworming

• Deworm heifers
  – Reach puberty 2 to 3 weeks earlier
  – Improved conception rates (7%)

(Mejia et al, 1999; Purvis and Whittier, 1996; Larson et al, 1992)
Ionophores

- Antimicrobial compounds fed to improve feed efficiency
  - Alter the rumen microflora
- Monensin, lasalocid, laidlomycin
Ionophores

- Purvis and Whittier (1996)
  - Puberty reached 10 d earlier
  - 5% increase in conception rates
- Mosely et al. (1997)
  - Increased puberty rates by 40%
  - Increased conception rates by 7%