Calf and Heifer Management

#2

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From Weaning to Breeding

• Heifers should be moved to a group pen
• Start feeding calf grower diet
  ✓ Calf grower can be fed, *ad libitum*,
  ------------------------------
  ✓ Feeding silages is not advisable
  ✓ Provide good quality hay
  ✓ Do not forget clean and adequate water
  ------------------------------

From Weaning to Breeding

• Maintain adequate growth to ensure breeding at desired age
• Ability to control gain during this time is the key to success
• Poor feeding programs will result in:
  ✓ Low daily gain
  ------------------------------
  ✓ Delay in breeding
  ✓ Delay in first calving

• Over feeding will result in:
  ✓ Excessive daily gain
  ------------------------------
Managing Heifer Development

Goals:
• Provide replacements for cows leaving the herd
• Improve genetics and production
• Raise heifers efficiently and economically

I. --------------------------------
II. Body size at calving
III. Controlling Expense – feed and labor
IV. Ease of care
V. Optimizing Health

Age at calving
Body size at calving

• The recommended goal for dairy replacement Holstein heifers:
  – Calving at --------------- months of age
  – Post-calving BW of --------------------------

Why 1250 lb After Calving?

• Data collected from 1980-1984:
  – Heifers calving between 1195-1250 lb had the highest milk yield in the first lactation
  – Milk yield drastically declined for heifers below 1100 lb.
  1st lactating cows that weighed 1250 lb produced 1775 lb more milk than those weighed 900 lb
  -------------------------- had a greater impact on milk yield than did --------------------------

Keown & Everett, 1986
Breed Based on Age or Weight?

50,000 DHIA records:

Question: relationship between age at 1st calving, post-calving BW and first lactation milk yield

Findings:
1. Optimum milk yield ➔ post-calving wt. = 1200-1300 lb
2. Weak correlation between milk yield and calving age
3. Reduced milk yield ➔ post-calving wt > 1300

1200-1250 post-calving weight supports optimum 1st lactation milk yield

Over-conditioned heifers do not perform well and have reduced milk yield

Remember:
1200-1250 lb. Post-calving weight translates to a 1300-1350 lb pre-calving weight

Should We Forget about Age?

Calving age, at when heifers reaches to 1250, is important

Late calving translates to less productive life

Late calving translates to larger expenses

$$ ➔ rearing heifers (birth to calving): $1800 - $2000

$$ ➔ The earlier the lactation occurs, the sooner the initial investment will be returned
Check These Numbers 😅

Delayed calving beyond 24 months

↑ rearing costs = ---------/mo/heifer

Effect of age at first calving on number of required replacements for a 100-cow herd

<table>
<thead>
<tr>
<th>Cull Rate (%)</th>
<th>Age at first calving</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>22</td>
</tr>
<tr>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>30</td>
<td>61</td>
</tr>
</tbody>
</table>

Looper & Belshard, 2000; Smith, 1999

What about earlier calving age?

Calving before and at 21 months is risky due to problems with rapid growth

• Since BW has a major affect on 1st lactation milk yield, calving @ 21 months may translates to:
  ✓ ~ 3.0 lb/day gain from birth to calving
  ✓ Age at breeding must be reduced to 11-12 months
  ✓ Excessive pre-pubertal weight gain

Sejrsen et al., 1982

What about earlier calving age?

BW gain of > -------------- lb/day may be detrimental to mammary growth and development and affects the subsequent lactation performance. Sejrsen et al., 1982
Attaining 1250 lb in 24 Months

- ADG of --------------- from birth to pre-calving (~1350 lb.)

- Sexual maturity of Holstein heifers begins at ------------------------------- (around 9-10 months of age)

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Attaining 1250 lb in 24 Months

- Maximum lb gain/day = ----------- lb

- Achieve ----------- lb & 48” height at 14 months of age

- ADG < 1.5 lb is unacceptable and not economical

- ADG > 2.0 lb is unacceptable and detrimental to milk yield
### Recommended ranges of BW and wither height for Holstein heifers

<table>
<thead>
<tr>
<th>Age (mo.)</th>
<th>Body weight (lbs.)</th>
<th>Wither height (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>120-125</td>
<td>31.5-33.2</td>
</tr>
<tr>
<td>3</td>
<td>226-240</td>
<td>35.2-37.1</td>
</tr>
<tr>
<td>5</td>
<td>322-354</td>
<td>38.4-40.4</td>
</tr>
<tr>
<td>7</td>
<td>420-463</td>
<td>41.1-43.3</td>
</tr>
<tr>
<td>8</td>
<td>460-510</td>
<td>42.3-44.0</td>
</tr>
<tr>
<td>9</td>
<td>510-570</td>
<td>43.4-44.5</td>
</tr>
<tr>
<td>11</td>
<td>615-662</td>
<td>45.4-47.8</td>
</tr>
<tr>
<td>13</td>
<td>712-791</td>
<td>47.1-49.3</td>
</tr>
<tr>
<td>14</td>
<td>761-604</td>
<td>47.5-50.0</td>
</tr>
<tr>
<td>15</td>
<td>850-900</td>
<td>49.0-51.2</td>
</tr>
<tr>
<td>16</td>
<td>958-1060</td>
<td>50.2-52.1</td>
</tr>
<tr>
<td>19</td>
<td>1000-1174</td>
<td>51.0-53.0</td>
</tr>
<tr>
<td>20</td>
<td>1100-1264</td>
<td>51.7-53.0</td>
</tr>
<tr>
<td>22</td>
<td>1247-1393</td>
<td>52.2-54.5</td>
</tr>
</tbody>
</table>

Adapted from Looper and Bethard

The progressive Dairyman

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**Accelerated Heifer growth**

- Feeding Higher amounts of properly formulated (30% CP) milk replacers
- Time: during the first four to six weeks of life; 2 lb of dry milk replacer
- ADG 2.0-2.2 lbs/Day

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Fig 46-1. Heifer weight can be accurately estimated by measuring heart girth using a weight tape (Courtesy of Iowa State University)
Goals for Heifer Management

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Brown Swiss &amp; Holstein</th>
<th>Ayrshire &amp; Guernsey</th>
<th>Jersey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality (%)</td>
<td>&lt;5</td>
<td>&lt;5</td>
<td>&lt;5</td>
</tr>
<tr>
<td>Weaning age (weeks)</td>
<td>4-6</td>
<td>4-6</td>
<td>4-6</td>
</tr>
<tr>
<td>Average daily gain (lbs./day)</td>
<td>1.6-1.8</td>
<td>1.4-1.6</td>
<td>1.2-1.4</td>
</tr>
<tr>
<td>Maximum prepubertal ADG (lbs./day)</td>
<td>1.8</td>
<td>1.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Average age at first breeding (months)</td>
<td>14</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Weight at first breeding (lbs.)</td>
<td>600</td>
<td>650</td>
<td>550</td>
</tr>
<tr>
<td>Withers height at first breeding (inches)</td>
<td>20</td>
<td>46</td>
<td>43</td>
</tr>
<tr>
<td>Services per conception</td>
<td>1.5 - 1.8</td>
<td>1.5 - 1.8</td>
<td>1.5 - 1.8</td>
</tr>
<tr>
<td>Age at first calving (months)</td>
<td>24 - 26</td>
<td>24 - 26</td>
<td>22 - 24</td>
</tr>
<tr>
<td>First lactating weight (lbs.)</td>
<td>1250</td>
<td>1000</td>
<td>600</td>
</tr>
<tr>
<td>Peak milk production (lbs./day)</td>
<td>70</td>
<td>60</td>
<td>55</td>
</tr>
</tbody>
</table>

Adapted: D. R. Winston, Virginia Tech

GROWTH STAGES

<table>
<thead>
<tr>
<th>Age</th>
<th>Weight (lbs.)</th>
<th>Average daily Gain (lbs.)</th>
<th>Percent Death (%)</th>
<th>Percent Culled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth to 3 Days</td>
<td>90 to 100</td>
<td>3 to 5</td>
<td>1 to 2</td>
<td>4 to 5</td>
</tr>
<tr>
<td>Liquid Feeding 140 to 180</td>
<td>1.2 to 1.4</td>
<td>2 to 10</td>
<td>1 to 2</td>
<td>1 to 3</td>
</tr>
<tr>
<td>Weaning to 7 Mos. 400</td>
<td>1.7 to 2.3</td>
<td>1 to 2</td>
<td>1 to 3</td>
<td>1 to 3</td>
</tr>
<tr>
<td>7 Mos. to Breeding 500</td>
<td>1.7 to 2.3</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Breeding to Calving 1500</td>
<td>1.5 to 2.2</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
</tbody>
</table>

A very good program has 90 percent of the heifers born alive enter the barn at springtime.

KEY TO SUCCESS IN HEIFER RAISING

Measure weight and height

Control growth
Breeding Age Heifers

- Breeding age (13-14 months)
  - Body condition score
  - With height measurement
  - Balanced ration: ~------------ lb DM

<table>
<thead>
<tr>
<th>CP: ------------- %DM</th>
<th>TDN: ----------- DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF: 32% DM</td>
<td>RUP: 20% of CP</td>
</tr>
</tbody>
</table>

- Make sure that heifers do not lose BW and body condition at this stage.

Parasite Control

- Heifers with heavy parasite loads decrease feed efficiency and may develop diarrhea and anemia
- Bedded manure packs should be cleaned often and thoroughly
- Coccidiosis is a common internal parasite
  - Oocytes are ingested and penetrate the gut of the heifer
  - Results in impaired feed efficiency and diarrhea
  - Ionophores prevent and control coccidiosis

Breeding and estrous Synchronization

- Start breeding at 13 months of age
  - This provides 3 insemination opportunities by 15 months of age
- Implement a strong visual observation schedule for detecting heat
- Implement a systematic breeding program (DO NOT USE OvSynch !!)
- Keep a good record of pregnancy and conception rates
  - Acceptable CR = 65%  CR goal = >80%