Calf Birth to Weaning Workshop

Klibs N. Galvão, DVM, MPVM, PhD, Dipl. ACT
College of Veterinary Medicine

galvaok@ufl.edu
Objectives of Raising Dairy Heifers

- Live calf at birth (< 5% stillbirths)
- Minimize morbidity (<25% from birth to weaning)
- Minimize mortality (< 5% from birth to weaning)
- Double birth weight until weaning; 180 lbs
- Start breeding at 14 months; 55% of mature weight; 800 lbs
- Pregnant at 15 months
- Calve at 24 months of age; 82% of mature weight; 1230 lbs
- Result in a lactating cow of high potential for production
### Target weights

**Table 1.** Target weights for dairy animals of differing mature size

<table>
<thead>
<tr>
<th>Mature body weight², lb</th>
<th>1000</th>
<th>1400</th>
<th>1800</th>
</tr>
</thead>
<tbody>
<tr>
<td>First bred, 55% mature weight, lb</td>
<td>550</td>
<td>770</td>
<td>990</td>
</tr>
<tr>
<td>Post-calving target body weight, lb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st calving, 82% mature weight</td>
<td>820</td>
<td>1150</td>
<td>1475</td>
</tr>
<tr>
<td>2nd calving, 92% mature weight</td>
<td>920</td>
<td>1290</td>
<td>1655</td>
</tr>
<tr>
<td>3rd calving, 100% mature weight</td>
<td>1000</td>
<td>1400</td>
<td>1800</td>
</tr>
</tbody>
</table>

¹NRC, 2001, p. 238.

²NRC presents equations on a shrunk body weight basis, which is 96% of full body weight; Since all weights are affected by this factor, full body weights are shown in this table for simplicity. Weights of third lactation cows can be divided by 0.96 for a more accurate estimate of mature body size. Conceptus weight (lb) can be calculated as (0.665 * (days pregnant - 190) + 18) * CBW / 99, where CBW is the expected calf birth weight.
How can we achieve those goals?

- Colostrum & Feeding management
- Housing
- Hygiene
- Fly control
- Others
- Establish SOP for each step
Colostrum

- Colostrum is the milk from the first milking only!!
Colostrum

- Timing
- Quality
- Quantity
- Conservation
- Testing
Colostrum

• Quantity, quality and timing
  – 0.75 to 1 gal of **good quality** colostrum in the first 6 h of life. 1-2 h is ideal.

< 20,000 cfu

≥ 22%
Colostrum Management - Time

- Efficiency of absorption is ~30% at birth
- Gut closure occurs in a linear fashion beginning at birth
- Closure complete by 24 h
Colostrum

- Conservation *(to control bacterial contamination)*
  - Ambient Temp *(feed it now!!!)*
  - Refrigerated *(2 d to 1 wk.)*,
    - preservatives: potassium sorbate 0.5% final solution
  - Frozen *(up to 1 yr)*
Colostrum

• Pasteurization (60°C/60 min)
  • Raw colostrum → source of infection of Mycoplasma, Mycobacterium, E. coli, Salmonella and more.
  • Johnson & Godden, 2007: Feed at 1-2 hs of age
  - Did not affect IgG concentration
  - Decreased bacterial contamination
  - Increased IgG concentration in serum (24hs)
  - Increased efficiency of absorption (35.6% vs 26.1% raw colostrum)
Colostrum-derived CR

• Feed 2 doses
Assessing Colostrum Management On-Farm

• Refractometer - $30-500 on Ebay or Amazon
• TP ≥ 5.5 mg/dl – adequate
• TP = 5.0 to 5.4 mg/dl – marginal
• TP < 5.0 mg/dl – fail
Assessing Colostrum Management On-Farm

- Refractometer - $30-500 on Ebay or Amazon
- Brix% ≥ 8.6 – adequate
- Brix% = 8.0 to 8.5 – marginal
- Brix% < 8.0 – fail
Survival Time Preweaning for Calves According to Serum IgG (n = 871 in 4 dairies)

Effect of serum IgG on survival time: $P < 0.01$

Santos et al. (2008)
Milk & Milk Replacers
Milk Feeding Period (1d to ~8 wks)

• Fresh salable or non-salable pasteurized milk or high quality milk replacer
• Feed twice a day or more to reduce digestive disturbance
• Feed out of an open-faced bucket, not a nipple bottle or nipple pail because nipples are hard to clean
• Observe calves at least twice a day for evidence of disease (diarrhea, septicemia, pneumonia)
Milk Feeding Period

- Traditionally 2 qts 2 X/d. Calves may drink up to 3.7 gal/d
- Many farms are adopting ad libitum milk feeding

<table>
<thead>
<tr>
<th>Week 1&amp;2</th>
<th>Weeks 3-6</th>
<th>Week 7</th>
<th>Week 8</th>
<th>Week 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 gal 2X</td>
<td>1.5 gal 2X</td>
<td>1.5 gal 1X</td>
<td>Grain only</td>
<td>Wean</td>
</tr>
</tbody>
</table>
Housing

- Calves are housed individually or in groups for the first 8-10 wks of age.
- Ad libitum feeding is more easily implemented with group housing.
Housing

- Heifers stay in group pens until calving
Introduction

Three important points for herd size growth:
- Good reproduction
- Low cow mortality and culling
- Good replacer heifer management

Morbidity and Mortality

Range between 8% and 11%.
- Scours, diarrhea, or other digestive problems accounted for the highest percentage of unweaned heifer deaths (60.5 percent). USDA 2007.
- Diarrhea and respiratory problems account for 85% of the deaths in unweaned calves.

[Graph: Percentage of Unweaned Heifers, Weaned Heifers, and Cows that Died During 2006, by Herd Size]

[Graph: Percent of Unweaned Heifer Calf Deaths by Cause]
Calf Diarrhea

• Diarrhea can occur at any age
• Most common in the pre-weaning period of life
• Can be caused by different types of organisms
Diarrhea Etiology

- **Viral**
  - Rota Virus
  - Corona Virus

- **Bacterial**
  - Escherichia coli - Zoonotic
  - Salmonella - Zoonotic
  - Clostridium

- **Protozoa**
  - Cryptosporidium - Zoonotic
  - Coccidia
Prevention of Diarrhea

• Proper nutrition program
  – Undernutrition is the major cause of high prevalence of disease in calves

• Sanitation and basic measures of biosecurity
  – Sanitation of environment and equipment, grouping of animals, and elimination of potential fomites

• Proper housing
  – Clean

• Vaccination programs
  – Vaccination of the dam (Corona and Rota viruses) to confer immunity through colostrums
Treatment of Diarrhea

• Dehydration is what kills the calf
  – Skin "tents", mouth isn’t slick, eyes are sunk
• Broad-spectrum antibiotics
• Continue to feed milk
• Rehydration with electrolyte feeding instead of water
  – Skin tents for 4-5 sec and calf drinks from a bottle, feed 1 bottle of electrolyte 2-3 times a day between milk feedings; otherwise use stomach tube
  – Skin tents for > 5sec, IV fluids (3-4 qts) 2-3 times a day is required
Respiratory Diseases

• Affects calves of all ages, but it peaks in the first two weeks after weaning

• Common agents
  – Viruses = bovine respiratory syncitial virus (BRSV), infectious bovine rinotraceitis virus (IBR), bovine viral diarrhea virus (BVD)
    – Bacteria = Mannheimia haemolytica, Pasteurella multocida, Histophilus somni, and Mycoplasma spp.
Respiratory Diseases
Prevention of Pneumonia

• Proper nutrition program
  – Undernutrition the major cause of high prevalence of disease in calves

• Sanitation and basic measures of biosecurity
  – Grouping of animals, sanitation, elimination of potential fomites

• Proper housing
  – Ventilation

• Vaccination programs
  – Critical for respiratory diseases (DVD, BRSV, IBR, PI3)
# Vaccination, DRU SOP

<table>
<thead>
<tr>
<th>Age</th>
<th>Product</th>
<th>Dose &amp; Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 0</td>
<td>Colostrum</td>
<td></td>
</tr>
</tbody>
</table>
| Day 1 - 5    | • Vitamin E and Selenium Supplement (Injection)  
               • Intranasal IBR + PI3 vaccine           | Follow Label           |
| 3 weeks      | • Modified live BVD (types 1 and 2), IBR,    | Follow Label           |
|              | BRSV and PI3 viral vaccine                   |                        |
| 4 weeks      | Dehorn                                       |                        |
| 5 weeks      | • Modified live BVD (types 1 and 2), IBR and PI3 viral vaccine  
               • 7 - way clostridial vaccine            | Follow Label           |
| 7 weeks      | • Pinkeye vaccine                            | Follow Label           |
|              | • 7 – way clostridial vaccine                |                        |
| 8 - 9 weeks  | Physical Exam and turn-out                   |                        |
Treatment of Pneumonia

• Antibiotics
• Anti-inflammatories/antipiretics
Questions??