Calving Management Practices for Dairy Herds
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My Job During the Day:

- Monitoring cows for signs of parturition
- Newborn ID and care
- Colostrum harvesting (monitoring quality)
- Feeding colostrum/milk to calves
- Monitoring FPT (total serum proteins)
- Cleaning and sanitation
- Record-keeping
Effect of Colostrum Management on Calf Survival

Figure 2. Comparison of Calf Survival Rates by Level of Immunoglobulin (IgG) Concentration

(National Dairy Heifer Evaluation Project, NAHMS, 1992)

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Motivators for Best Colostrum Management?

- Failure of Transfer of Passive Immunity:
  - Increased sickness risk
  - Increased death loss
  - Decreased weight gain
  - Decreased long-term performance (milk)
  - ...

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Key Factors Influencing Passive Transfer

• Quality
  – >50 mg/mL IgG (50 g/L)

• Quantity
  – At least 4 L (1 gallon or 4 qts)

• Timing
  – 4 L within 3 hours

• Clean and sanitation
  – Minimal bacterial load
Colostrum IgG Absorption in Calves

Timing of Harvest - Colostrum

• IgG concentration decreased 3.7% each hour after calving
• Hygiene practices affect bacterial load
Feeding Colostrum

- **Method:** Bottle and esophageal tube
- **Type:** Fresh, refrigerated, frozen
Monitoring Quality

Evaluation of a Brix refractometer to estimate serum immunoglobulin G concentration in neonatal dairy calves

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ABSTRACT

The objective of this study was to evaluate the use of a digital Brix refractometer for the assessment of serum immunoglobulin G (IgG) concentration in neonatal dairy calves. The Brix refractometer readings were compared with serum IgG concentrations measured using a microplate method. The Brix refractometer was found to be a reliable tool for estimating serum IgG concentrations in neonatal dairy calves.
Colostrum Contamination

Figure 1. Mean log$_{10}$ total plate count and mean log$_{10}$ total coliform count for colostrum samples collected from the udder, the milking bucket, and the esophageal feeder tube. a,b Different subscripts differ within bacteria type group, $P < 0.05$. (Stewart et al., 2005)
Potassium sorbate as preservative
Feed refrigerated colostrum within 48 hours

... (Stewart et al., 2005)
Frozen in 4 L Bags

May be frozen for up to 6 months
Better to store in 2 gallon zip-lock bags
Kills WBCs (lymphocytes)

...
Pasteurization

• 140 °F (60 °C) for 30 min:
  — Reduces count of bacteria without affecting IgG levels
  — No viable Mycoplasma bovis, Listeria monocytogenes, Escherichia coli O157:H7, or Salmonella enteritidis could be detected

• 140 °F (60 °C) for 60 min:
  — IgG concentrations not significantly lowered (2-10%)
  — Good IgG absorption
  — Reduction in leukocytes
Measuring Colostrum Quality

Colostrometer:

• Highly dependent on $T^\circ$ of colostrum. should be tested at room $T^\circ$ (20-25 $C^\circ$)
• Semi-quantitative (colors)

**Red:** poor quality, Ig < 22 mg/mL

**Yellow:** moderate quality, Ig 22-50 mg/mL

**Green:** excellent quality, Ig > 50 mg/mL
# Measuring Colostrum Quality

<table>
<thead>
<tr>
<th>Brix (%)</th>
<th>IgG Conc. (g/L)</th>
<th>Colostrum Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 15</td>
<td>0 - 28</td>
<td>Poor</td>
</tr>
<tr>
<td>15 - 20</td>
<td>28 - 50</td>
<td>Fair</td>
</tr>
<tr>
<td>20 - 30</td>
<td>50 - 80</td>
<td>Good</td>
</tr>
<tr>
<td>&gt; 30</td>
<td>&gt; 80</td>
<td>Very Good</td>
</tr>
</tbody>
</table>

[Image of a device for measuring colostrum quality]
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THE OHIO STATE UNIVERSITY

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