Raising Health Calves

Sheila M. McGuirk, DVM, PhD
School of Veterinary Medicine
University of WI

It is worth the effort

- Cost of raising from birth to calving
  - $9.31/day from birth to group pen
  - $2.04/day from group pen to calving
  - $1,650 from birth to freshening
- 97% of operations (87% of heifers) home raised

- Cost of buying
  - 90-120 lb calf: $200-$650
  - Springing heifer: $1,800-$2,000

US Data

- Given average herd turnover rates, calving interval, stillbirths, deaths and culling -
  3-4% surplus heifers
Good News

• From 48 hours to weaning, calf death rates are going down
  - 1996: 10.8%
  - 2007: 7.8%

Bad News

• Calf deaths within 48 hours of birth (stillbirths) are going up
  - 1996: 93.4% live births
  - 2007: 86.0% live births

Calf deaths within 48 hours of calving (> 260 days DCC)

• 75% occurs within 1 hour
• 10% before birth
• 10% after birth
Reducing First 48-hour Death Loss

- Supervision prior to and during calving
- Proper procedures for assisting delivery
  - Timing
  - Methods
- Resuscitation protocols
- Calling the DVM before it’s too late

Calving Assistance

- Guidelines and training are critical
- Observation of calving progress every hour
- Assist when needed but not just to get the calving finished
- Labor is important for the calf’s vitality
- Intervention is bad for the cow and the calf

Know What is Expected of the Newborn Calf

- If they don’t do what is expected, you know that you have a high risk calf
- If they are stained yellow, they are high risk
Normal newborn calves
Vaginal Delivery

- Head righting in minutes
- Sitting in 5 minutes
- Attempts to stand within 15 minutes
- Standing within 1 hour
- Temp declines to 101-102 by 1 hour
- Suckling within 2 hours
- Respiratory rate: 50-75 breaths/min
- Heart rate: 100-150 beats/min

Consequences of poor adaptation

- Decreased activity, lethargic calves
- Delay intake and/or absorption of colostrum
  - decreased energy/nutrient intake
  - decreased fluid volume
  - decreased antibody transfer
- Hypothermia
- Low blood sugar
- Low oxygen levels
- Decreased disease resistance

A Basic Care Package

- Colostrum
- Calories
- Consistency
- Cleanliness
- Comfort
Colostrum

• Tasks
  - Remove the calf from the cow within 30 min
  - Have 4 quarts of good colostrum from one cow
  - Warm colostrum
  - Give it to the calf as soon as it wants to suck but not longer than 4 hours

• Training
  - Importance of removing the calf is to avoid manure meals
  - How to use an esophageal feeder
    - Calf position
    - Giving the right amount
    - Position of the head
    - 4 qt are necessary

What is GOOD colostrum?

• From a cow or first calf heifer is healthy
• Donor is vaccinated
• Cow or first calf heifer has been in prefresh group 2 - 3 weeks
• Udder is prepared just like milk was going to the saleable milk tank
• Cow is milked within 2-4 hours of calving
• If colostrum isn’t fed right away, it is in refrigerator
• If colostrum is older than 3-days, it is thrown out

If there isn’t enough colostrum, we need a back up plan:
  frozen colostrum or 2 packs of colostrum replacement product.

150-200 gm of IgG
Colostrum Replacement Products

Know that you deliver 150-200 gm IgG
Don't put it into the colostrum
Mix as directed and feed 1.5-2 packs

Using the Esophageal Feeder

Calf standing
Nose below ears
4 qt is needed

Colostrum Issues

• Calves need 150-200 gm of IgG
• Fresh colostrum is best for all the other nutritional and immune factors
• Colostrum must have 50 gm IgG/L

• If the esophageal feeder is used, give 4 qt
• 3 qt may be ok if calf sucks all of it
• Bacteria in colostrum inhibit absorption of antibodies
  - Udder preparation
  - Feed it or chill it
### A Basic Care Package

- Colostrum
- Calories
- Consistency
- Cleanliness
- Comfort

### Calories

![Calves feeding](image)

### Liquid Feed for Calves

<table>
<thead>
<tr>
<th>Type</th>
<th>Protein</th>
<th>Fat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole Milk</td>
<td>26-27%</td>
<td>30%</td>
</tr>
<tr>
<td>Conventional Milk Replacers</td>
<td>20-22%</td>
<td>10-22%</td>
</tr>
<tr>
<td>Intensive Milk Replacers</td>
<td>26-30%</td>
<td>15-20%</td>
</tr>
</tbody>
</table>

Feed to the genetic potential.
Calf Feeding Behavior

- Calves in small groups ate more solid feed and had higher gains than individual housing
- With a cow, calf suckles 7-10 times day
- Ad lib access to liquid feed, calves consume up to 11 qt/day
  - Recommend 5.5 qt/day
  - Some consider 8.8 qt/day the recommendation
- With more milk consumed, calves have fewer health problems

Growth Objectives

- Days 2-14: 1.1 lb/day
- Days 15-45: 1.7-2.2
- Decrease liquid feed days 46-53 by 50%
- No liquid feed after 54 days
- 6-10 days to recover starter intake
- Forages at 5 lb starter intake
- TMR before 5 months must be done with care
- Fed 1.8 to 2.5 lb of milk solids/day, calves can double their birth weight and grow 4-5" in height by weaning

Dairy Calves Eating
< 0.5 lb Starter are the Problem

<table>
<thead>
<tr>
<th></th>
<th>32 F</th>
<th>0 F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy for gain (lb)</td>
<td>Wt loss</td>
<td>Wt loss</td>
</tr>
<tr>
<td>Protein for gain (lb)</td>
<td>Wt loss</td>
<td>Wt loss</td>
</tr>
</tbody>
</table>
### Dairy Calves Eating<br>**< 0.5 lb Starter are the Problem**

<table>
<thead>
<tr>
<th>1-wk, 100 lb calf, 6 qt wm/day, 0.1 lb starter</th>
<th>32 F</th>
<th>0 F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy for gain (lb)</td>
<td>0.94</td>
<td>0.44</td>
</tr>
<tr>
<td>Protein for gain (lb)</td>
<td>1.32</td>
<td>1.32</td>
</tr>
<tr>
<td><strong>Until 1 lb, starter intake, need 6 qt wm/day</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Dairy Calves Eating<br>**< 0.5 lb Starter are the Problem**

<table>
<thead>
<tr>
<th>1-wk, 100 lb calf, 20-20 all milk mr</th>
<th>8.4 lb CW; 5.6 lb WW</th>
<th>CW: ave 25 F</th>
<th>WW: &gt;60 F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy for gain (lb)</td>
<td>No gain</td>
<td>No gain</td>
<td></td>
</tr>
<tr>
<td>Protein for gain (lb)</td>
<td>0.79</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td><strong>Target gains: 11.5 lb in cw or 8.3 lb in ww</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Cold Weather Feeding

- Add another meal of the same mix
- Don’t concentrate powder
- Added ingredients are not as good as a third meal
- Calves still need water
- Always have fresh, clean starter in front of the calf to encourage intake
A Basic Care Package

- Colostrum
- Calories
- Consistency
- Cleanliness
- Comfort

Consistency

- Same feed
  - What’s in it
  - How it’s mixed
  - Temperature
  - Way it’s fed
- Same time each day
- Same pattern
- Warm water given within 20-30 minutes of milk or before sleeping
- Same pen

Dietary Changes That Can Be Bad

- Sodium (salt) levels
- Osmolarity - affects stomach emptying
- Lasalocid > 2X
- Electrolyte powder in liquid feed
- Variation in total solids
  - MR powder levels
  - Waste milk variation
- Limited water in cold weather
Inconsistencies and Clostridium

Organism

Carbohydrates and Protein

Abnormal motility

Proliferation
Sporulation
Toxin production

Additives
Medication
Infection

A Basic Care Package

- Colostrum
- Calories
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- Cleanliness
- Comfort

Cleanliness

- Maternity pen
- Cows in maternity pen
- Transport cart
- People moving and handling calves
- Warming, holding or drying area
- Calf housing
- Feeding equipment
- Feeds
Cleanliness

It looks good but it isn’t. Cows are shedding at high rates.

Communal warming/drying areas: only for calves taken out of calving area immediately!

First Manure Meal: Bedding
Second Manure Meal: Cow or the Wall

Third Manure Meal: Udder

Fourth Manure Meal: Colostrum
How Calves Spend Their Day

Table 4. Percentages of time spent on different activities as affected by week (n = 60).

<table>
<thead>
<tr>
<th>Week</th>
<th>Standing</th>
<th>Eating</th>
<th>Self</th>
<th>Investigating</th>
<th>Contacting</th>
<th>Drinking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11.4%</td>
<td>1.4%</td>
<td>2.0%</td>
<td>0.2%</td>
<td>2.1%</td>
<td>10.0%</td>
</tr>
<tr>
<td>2</td>
<td>9.9%</td>
<td>3.2%</td>
<td>2.4%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>16.6%</td>
</tr>
<tr>
<td>3</td>
<td>6.7%</td>
<td>4.0%</td>
<td>2.9%</td>
<td>1.1%</td>
<td>9.9%</td>
<td>11.3%</td>
</tr>
<tr>
<td>4</td>
<td>6.0%</td>
<td>5.5%</td>
<td>4.8%</td>
<td>2.1%</td>
<td>5.8%</td>
<td>12.0%</td>
</tr>
<tr>
<td>5</td>
<td>6.5%</td>
<td>4.5%</td>
<td>4.8%</td>
<td>2.8%</td>
<td>3.8%</td>
<td>10.0%</td>
</tr>
<tr>
<td>6</td>
<td>4.4%</td>
<td>4.0%</td>
<td>4.8%</td>
<td>2.0%</td>
<td>7.2%</td>
<td>12.0%</td>
</tr>
<tr>
<td>SE</td>
<td>1.1</td>
<td>0.5</td>
<td>0.4</td>
<td>0.6</td>
<td>0.8</td>
<td>0.3</td>
</tr>
</tbody>
</table>

***Means within a column without a common superscript letter differ (P < 0.05).

Panivivat JDS 2004;87:3736

It is what is underneath them and what gets in their mouth

- By-pass
- Dilute
- Distance them from it.

Cleanliness in Calf Environment

- Bedding
- Feeds and feeding equipment
- What gets on their skin
- Pen itself
A Basic Care Package

• Colostrum
• Calories
• Consistency
• Cleanliness
• Comfort

Comfort

• Straw for newborns
  - Critical temperature range is 55–75 F
  - Use less energy to stay warm and have more to grow and fight disease
• Deep, dry bedding
  3” deep

Blankets help.
The deeper the straw, the less respiratory disease

- Calories not diverted to warming but used to fight infection

Dehorn with Pain Management

Feed the sick calves in cold weather

- Don’t hold milk from a calf with diarrhea
- Offer warm water 20-30 minutes after milk
- Small amounts of fresh starter
  - Dehydration
  - Malnutrition
  - Low blood sugar
  - Salt toxicity
Find the sick calves!

- Early detection of disease is a challenge, especially respiratory disease
  - Appetite change may be very subtle
  - Fever isn’t reliable
- Watch the calves that don’t lie down after eating

Know who is most susceptible

- Diarrhea
  - From birth to 14 days
- Respiratory
  - From 3 weeks through weaning
- Navels
  - 5 days to 14 days

Find the fecal scores 2, 3 or with blood

- Extra feeding of electrolytes
- Two extra feedings of electrolytes
- Antibiotics if bloody or sick
- Find the calves that don’t lie down after eating

Extra Extra feeding of feeding of electrolytes electrolytes
- Two extra Two extra feedings of feedings of electrolytes electrolytes

Antibiotics if Antibiotics if bloody or bloody or sick
Respiratory Scoring To Find the Sick Calves

Signs of Detection Problems

From Outside of the Calf

- Nasal Discharge
- Eyes
- Ears
- Spontaneous coughing
Respiratory Scoring Criteria:
Nasal Discharge

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
</table>

Eye Discharge

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
</table>

Ear Score

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
</table>

Eye/ear category: highest score is assigned.
Inside the Pen or Hands-On

<table>
<thead>
<tr>
<th>Rectal temperature</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-100.9</td>
<td>0.00</td>
<td>1.00</td>
<td>2.00</td>
<td>3.00</td>
</tr>
<tr>
<td>101-101.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>102-102.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥103</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cough</td>
<td>None</td>
<td>Induced single cough</td>
<td>Induced repeated cough or occasional spontaneous cough</td>
<td>Repeated spontaneous cough</td>
</tr>
</tbody>
</table>

Best Scoring Results

- Twice weekly from 3 weeks to weaning
- After treating the calf for 5 to 6 days
- Before they go to a group pen
Decreasing Respiratory Disease in Calves

- Decrease calf to calf contact
  - Barriers between calves
- Increase nesting score
- Decrease aerosol bacteria
  - Increase pen size > 24 sq ft
  - Limit barriers surrounding the calf
  - Colder temperatures
  - Supplemental outside air

Colostrum
Comfort
Consistency
Cleanliness
Calories

Questions?