ASSESSMENT, SCORING AND DISEASE MANAGEMENT OF DAIRY CALVES

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Basic Care Package

Five C's
- Colostrum
- Calories
- Consistency
- Comfort
- Cleanliness

Making a Difference

- Colostrum
- Nutrition

Reducing Mortality in the First 24-hours

- Most calves that die within 24-hours of birth are alive when born
- With normal presentation, sustained progress, observe but do not assist
- If moved during labor, allow time for labor to resume
Herd Goals for Dairy Calves

- Stillbirth rate for whole herd less than 6%
  - First lactation: less than 8%
  - Second lactation and greater: less than 4%
- Stillbirth rates > 10%, need calving management training
- Not more than 30% of calvings need assistance
- Calves dying in first 24-48 hours: < 2%
- Calves dying 48 hours to weaning: < 5%

Achieving Goals: Have a Calving Plan

- Standard procedures are understood and recorded
- Intervention criteria are established
  - Time
  - Progress
  - Position of Calf
- Good labor area
  - Space
  - Cleanliness
  - Lighting
  - Restraint capability
- Hygiene and lubrication during assistance
- Good records
- Attention to calving ease in sire selection
- Training of calf group

Reducing Mortality in the First 24-hours

- Prevent dystocia
  - Sire calving ease (SCE) <8%
  - Daughter calving ease (DCE < 6%)
- Assist only when necessary
- Particular attention to first calf heifers and cows with twins
- Train, train and retrain
- Monitor equipment, supplies, calving cows and records

Training to Reduce Stillbirths

1. Description of signs associated with labor stages
2. Learn when and how to assist
3. Know how to correct abnormal presentation, position or posture of calf
4. Calving hygiene practices
5. Accurate record keeping
6. Expected communication
7. Newborn calf care
Unassisted Vaginal Delivery is Best for the Calf and the Cow

- Vaginal delivery improves calf vigor and survival
- Outside the pen supervision every 15 minutes
- Assist only when necessary
  - Abnormal position
  - Sustained lack of progress
  - 70 min after amniotic sac appearance
  - 65 min after feet appearance
- Use proper assistance protocols
- Call for help before it is too late

Observation for Normal Behavior

- Head righting in minutes
- Sitting in 5 minutes
- Attempts to stand within 15 minutes
- Standing within 1 hour
- Temp high at birth, declines to 101-102 by 1 hour
- Suckling within 2 hours

Drug-Free Resuscitation

- Postural drainage
- Topline towel rub from tailhead to poll
- Towel stimulation of ears, eyes and nose
- Compress and shake trachea
- Ice-water in ear
- Pinpoint nasal pressure
- Suction nose and throat
- Infrared radiant heat

Ice Water Technique

- 60 cc of ice water in the ear
- 250 to 500 cc over the poll of the head
- Results in vigorous head shaking
- Improved pulmonary gas exchange
Navel Care

- Prevent infection
  - Spontaneous rupture
- Clean calving environment
- Immediate removal to well-bedded calf pen
- Clean colostrum
- Navel disinfection - spray or dip cord
  - 1.2, and 7% iodine
  - 0.5% chlorhexidine
  - Navel-Guard

Put Colostrum Testing Into Action

Mark High-Risk Calves

Classify Herd Status

- Failure of Passive Transfer Based on serum total protein (STP)
  - More than 20% below 5.5 gm/dl
  - More than 10% below 5.2 gm/dl

Refractometer Calibration

A systematic review of colostrum protocols may be needed.

- Colostrum Volume
  - Less than 4 quarts given by esophageal feeder
  - Less than 3 quarts suckled
- Colostrum Quality
  - High producing cows
  - Delayed milking
  - Calf suckles
  - Cow leaks
  - Short dry period
- Poor absorption
  - Delayed feeding
  - Bacterial contamination
  - Additives in maternal colostrum
  - Calving assistance
Training to Use the Esophageal Feeder

Selective Use of Esophageal Feeder
- Standing position for calf if possible
- Calf must be able to maintain sternal recumbency
- Not for use in calf with respiratory effort
- Not for use in calf with abdominal distension
- Equipment is sanitized and in good condition
- Do not force feed milk/milk replacer without veterinarian’s recommendation
- Limit forced milk feedings (usually 3 or less)

Equipment Selection
- Colostrum
- Oral Electrolyte Solution

Keep the nose below the ears.
How many esophageal feeders are needed?
The number should equal the maximum number of calves that might need an esophageal feeder in one day – colostrum or oral electrolyte solution.

Sanitizing the Esophageal Feeders

Are We Feeding Enough?
- NRC Simulation Program
- Use actual ration inputs
- Assumptions may be needed for starter intake
- Adjust for calf body weight
- Use environmental temperature
- Have a plan

Assumptions Needed for NRC Calculator

<table>
<thead>
<tr>
<th>Week</th>
<th>Body Weight</th>
<th>Estimated Starter Intake (lb)</th>
<th>Average Daily Gain (lb/day)</th>
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<tbody>
<tr>
<td>1</td>
<td>Ave birth wt</td>
<td>0.25</td>
<td>1.0</td>
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<tr>
<td>2</td>
<td>Birth wt +7</td>
<td>0.5</td>
<td>1.2</td>
</tr>
<tr>
<td>3</td>
<td>Week 2 + 8.4</td>
<td>0.75</td>
<td>1.6</td>
</tr>
<tr>
<td>4</td>
<td>Week 5 + 11.2</td>
<td>1.0</td>
<td>1.8</td>
</tr>
<tr>
<td>5</td>
<td>Week 4 + 12.6</td>
<td>1.5</td>
<td>2.0</td>
</tr>
<tr>
<td>6</td>
<td>Week 5 + 14</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>7</td>
<td>Week 6 + 14</td>
<td>3.0</td>
<td>1.4</td>
</tr>
</tbody>
</table>
ADG (lb):
Holstein 80 lb birth weight – 2 wks

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</thead>
<tbody>
<tr>
<td>20° F</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
<td>1.3</td>
</tr>
<tr>
<td>40° F</td>
<td>1.4</td>
<td>1.5</td>
<td>1.5</td>
<td>1.6</td>
</tr>
<tr>
<td>60° F</td>
<td>1.4</td>
<td>1.5</td>
<td>1.6</td>
<td>1.9</td>
</tr>
<tr>
<td>80° F</td>
<td>1.4</td>
<td>1.5</td>
<td>1.6</td>
<td>1.9</td>
</tr>
</tbody>
</table>

95 lb at 14-days
• 0.5 lb starter intake;
• 10 oz powder per 2 qt water
• 6 qt/day

95 lb at 14-days
• 0.5 lb starter intake;
• 10 oz powder per 2 qt water
• 8 qt/day

Monitor Feeding Consistency
• Total solids
• Temperature
  • Mixing
  • Feeding
• Delivery – same feed from first to last calf
• Additives
• Timing
• Between feeders
• Water delivery within 20 to 30 minutes of milk/milk replacer feeding
Total Solids

**Calculate**
- 10 oz powder = 0.625 lb
- 2 qt water = 4.17 lb
  \[ \frac{0.625}{0.625 + 4.17} \]
  = 13% solids

**Measure**

**Variability may be more than you expect.**

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1</td>
<td>12.2</td>
<td>15.6</td>
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<td>2</td>
<td>11.5</td>
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<tr>
<td>3</td>
<td>12.5</td>
<td>19.3</td>
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<tr>
<td>4</td>
<td>8.8</td>
<td>16.0</td>
</tr>
<tr>
<td>5</td>
<td>10.9</td>
<td>14.4</td>
</tr>
</tbody>
</table>

Koepnick and McGuirk, 2010

**Milk Delivery Consistency**

- What is calculated
- What is in the machine or bucket
- What the calf drinks

**The Importance of Water**

- Fed after every feeding
  - Winter and summer
  - Starting by day 3
- Delivered warm
- Especially with diarrhea
- Absolutely necessary for calves getting electrolytes
- Allows the calf to “correct” feeding errors

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**Advising animal and human health with science and compassion**
Regularly Assess Milk Quality

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Total Bacterial Count</th>
<th>Goals (cfu/ml) Total Coliform Count</th>
<th>Total E. coli Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colostrum</td>
<td>&lt; 100,000</td>
<td>&lt; 10,000</td>
<td>&lt; 1,000</td>
</tr>
<tr>
<td>Waste Milk</td>
<td>&lt; 500,000</td>
<td>&lt; 200,000</td>
<td>&lt; 1,000</td>
</tr>
<tr>
<td>Pasteurized waste milk</td>
<td>&lt; 20,000</td>
<td>&lt; 1,000</td>
<td>&lt; 100</td>
</tr>
<tr>
<td>Milk replacer</td>
<td>&lt; 10,000</td>
<td>&lt; 1,000</td>
<td>0</td>
</tr>
</tbody>
</table>

With automatic feeders, collect milk through the nipple.

Managing Calf Health

- Daily Observation
- Twice Weekly Screening
- Defined Exam Process

Early Detection for More Effective Treatment

Effective and Efficient Calf Health Screening

- Maximize disease detection
- Facilitate early intervention
- Minimize treatment cost
- Gather data
  - Track incidence/prevalence
  - Treatment response
  - Cost
- Reduce mortality
- Shorten disease duration
- Improve treatment outcomes
Address the Most Important Conditions of Calves

<table>
<thead>
<tr>
<th>Producer-Attributed Cause of Death</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scours, diarrhea, or other digestive</td>
<td>56.5</td>
</tr>
<tr>
<td>Respiratory</td>
<td>22.5</td>
</tr>
<tr>
<td>Unknown reason</td>
<td>7.8</td>
</tr>
<tr>
<td>Calving problem</td>
<td>5.3</td>
</tr>
<tr>
<td>Other known reason</td>
<td>4.3</td>
</tr>
<tr>
<td>Lameness or injury</td>
<td>1.7</td>
</tr>
<tr>
<td>Joint or navel problem</td>
<td>1.6</td>
</tr>
<tr>
<td>CNS, incoordination, depression</td>
<td>0.3</td>
</tr>
</tbody>
</table>

The common bugs...

- Salmonella spp.
- Coccidia.
- Cryptosporidium parvum
- Coronavirus
- Rotavirus
- Clostridium perfringens
- ETEC

Health Evaluation Must Not Penalize

- Calves
- Screeners
- Examiners
- Treatment Crew

Labor Needs: It Takes a Trained Team

- 1 FTE/100 calves for routine chores
- 0.5/100 calves for health management
It Takes a Defined Process

Daily Observation

- Accomplished during other chores
  - Picking up bottles
  - Dumping milk/water
  - Putting out calf starter
- Calves still standing when most are lying
- Calves slow to get up for feed

Screeners Find...

- Calves still standing when 90% are lying down or calves still lying when 90% are standing
- Diarrhea
- Bleeding (anywhere)
- Discharge – eyes or nose
- Sunken eyes
- Abnormal posture
  - Arched back
  - Tilted head
  - Star-gazing
- Coughing calves
- Breathing effort/noise

Timing of Health Screening

- Incorporate some aspects into normal chores
  - Collecting milk buckets/bottles
  - Delivering water
  - Picking up refusals
- Last calves standing after feeding
- Last calves to rise at feeding time

Observers have good “calf sense”.
Mark Calves/Pens that Need Full Exam

Full Exam by Highly Trained Workers (1)

- Temperature
  - > 103°F
  - < 100°F

- Head position
  - Tilted
  - Star gazing
  - Dropped or extended

- Discharge
  - Eyes
  - Ears

Full Exam by Highly Trained Workers (2)

- Nasal Discharge
  - Color
  - Amount

- Cough
  - Spontaneous
  - Induced

- Breathing Pattern
  - Rapid
  - Grunting
  - Abdominal effort/snap

Full Exam by Highly Trained Workers (3)

- Navel
  - Thick
  - Painful or hot
  - Discharge or malodorous

- Legs
  - Lame, won’t get up
  - Swelling
  - Crooked

- Feces
  - Loose
  - Watery
  - Blood
Screening Tools

- Calf Health Scoring App
- Group Pen Respiratory Scoring

Diagnostic Testing May Help

- Post-Mortem Exams are Useful
  - Training to open dead calves
  - Collect samples
  - Take pictures for the Veterinarian

- Treatments Needed
  - Written protocols from a veterinarian who is actively involved by participation, training and monitoring results
  - Treatment crew that has good skills, cares about animals, has patience, gets results
  - Manager who leads by example

- Communication is essential
  - Exam to treatment crew
  - Treatment to manager
  - Manager to records
  - Stall side markers help
Treatment Status

Avoid Calf Vaccination Pitfalls

• Vaccinating sick/stressed calves
• Multiple vaccines at once
• Gram negative bacterial components
  • Pasteurella and Mannheimia
  • Salmonella
  • Mycoplasma bovis
• Half-dose vaccinations

Where are your weak points?

• Delayed removal from maternity
• Contaminated colostrum
• Esophageal feeder
• Warming area bedding
• Calf pen bedding
• Inadequate nutrition
• Limited water
• Contaminated feed
• Feed refusals dumped in calf housing
• Limited time between successive occupants

• Failure to remove bedding or stall base between calves
• Lack of sanitation protocols for feeding equipment
• Delayed disease detection
• Incomplete/ineffective treatment
• Cold stress
• Over vaccinating

Do you have any questions?