What is the goal?
Calf Immune Function

- Calf completely naïve at birth
- Absorption of Colostrum antibodies
- Calf’s own immune system begins to take over
- Calf begins to have full immune function by 5-8 months of age
- Maternal Antibody declining by branding time 2-4 months of age
Post-Partum Considerations

• Colostrum
  – Antibodies, fat, vitamins, and WBC
  – 10% BW by 24 hrs (~3-4L)
  – Absorption time limited
    • Closure starts at 6 hours
    • 50% by 9 hours
  – Lifetime performance
    – 6.4 X likely to get sick as neonate
    – 3.2 X likely to get sick pre-weaning
    – 5 X likely to die
  – Dairy colostrum??
  – Replacer vs Supplement??

Cold Stressed Calves

• Mild- (<100F)
• Severe- (<94F)
• Options??
  – Floorboard heater in pickup, heating lamps and blankets, warm water immersion (warm slowly to 100F/replace water frequently to keep temp), warming boxes, warm water IV Fluids
  – Can take 1-1.5 hrs to warm calves back to normal body temperature. It takes time!!!
Neonatal diarrhea (scours)

- **Bacteria**
  - *E. coli*
  - Salmonella
- **Viruses**
  - Rota
  - Corona
- **Protozoa**
  - Crypto
  - Coccidia

Most of these are on every cow-calf operation

Age when scouring

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Days of age</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>E. coli</em></td>
<td>1-5</td>
</tr>
<tr>
<td>Rota virus</td>
<td>10-15</td>
</tr>
<tr>
<td>Corona virus</td>
<td>20-25</td>
</tr>
<tr>
<td>Crypto</td>
<td>30</td>
</tr>
<tr>
<td>Salmonella</td>
<td>10-20</td>
</tr>
<tr>
<td>Coccidia</td>
<td>30</td>
</tr>
</tbody>
</table>

Days of age
Biosecurity

- Calve in a clean environment!!
  - Move shelters several times during calving season
  - Feed in different areas
  - Minimize contamination of resting areas (waters/under trees etc)
  - Bedding?
- Older calves give spread pathogens to young newborn calves
  - Separate!!!!

Biosecurity

- Basics of Sandhills Calving System
  - “Solution to pollution is dilution”
  - Minimizing contact time by increasing space
  - Segregating calves by age
  - Moving pregnant cows to clean calving pastures (leaving cow/calf pairs) every 2 weeks
  - Can be managed together after youngest calves are 1 month old
Biosecurity

• Mold the principles to fit your operation
  – Calve close to facilities
    • Every two weeks move Cow/Calf pairs to new pasture
      – Still keeping different aged calves segregated
      – If drylot pen, scrape/remove manure often (easier said than done)

“RULE OF THUMB” TO FOLLOW:

• FLUID THERAPY
  – TONGUE WARM AND STILL NURSING
    • ORAL ELECTROLYTES
  – DOWN, MOUTH COLD AND WEATHER COLD
    • CRITICAL – MAY NEED IV FLUID THERAPY

• >2 CALVES INVOLVED TIME FOR DIAGNOSTICS
  – FECAL SAMPLING/NECROPSY-TISSUE SAMPLES
  – ALLOWS FOR CORRECT TREATMENT AND HUMAN SAFETY
Change in Threat

• As cattle age threat from calf scours to BRD (Bovine Respiratory Disease)

Immune system

**Helps**
- Quality nutrition
- Clean environment
- Vaccination
- **Maturity**

**Hurts**
- Stress
  - Weaning
    - Most stressful time in the life of a bovine
  - Changes in feed
  - Extreme weather
  - Management practices
    - Castration
    - Dehorning
  - Transportation
  - Mixing groups of cattle
How early can you vaccinate??

• Reliable response to vaccine by 2-3 months old
• As early as 1 month with some products
  – Work with your veterinarian for recommendations

Goal: Reduce Compounding Stressors

Immunity

Vaccination

Weaning
Shipping
Commingling
Change feed

Disease

Disease Challenge
General Guidelines Calves

• Need a functional immune system to get adequate response
• **Biggest concern is BRD**
• When should be vaccinate?
  – Branding time
    • 3-4 months of age
    • Maternal antibody decline, own immunity increasing
  – Pre-weaning
    • This greatly increases the immunity against selected pathogens
  – Weaning?
    • Does a stressed animal’s immune system function fully?

General Guidelines

• What do we vaccinate against?
  – Clostridial Diseases (7 or 8-way)
    • Don’t forget about tetanus
      – Banding or de-horning
  – 5 way MLV viral
    • Respiratory viruses
  – Respiratory Bacterins
    • Mannheimia/Pasturella/Histophilus
Timing is everything

A survey of recommended practices made by veterinarian practitioners to cow-calf operations in the United States

Fike, G.*, J.C. Simroth†, D.U. Thomson‡, R. Spare§, and A.J. Tarpoff§

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†Department of Diagnostic Medicine/Pathobiology, College of Veterinary Medicine, Kansas State University, Manhattan, KS, 66506
‡Ashland Veterinary Center, Inc., Ashland, KS 67831
§Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS, 66506
Recommended vaccines and practices for calves at branding

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clostridial</td>
<td>96</td>
</tr>
<tr>
<td>IBR</td>
<td>94</td>
</tr>
<tr>
<td>BRSV</td>
<td>91</td>
</tr>
<tr>
<td>PI3</td>
<td>90</td>
</tr>
<tr>
<td>Bovine Viral Diarrhea Type I</td>
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<tr>
<td>Bovine Viral Diarrhea Type II</td>
<td>77</td>
</tr>
<tr>
<td>Mannheimia haemolytica</td>
<td>45</td>
</tr>
<tr>
<td>Moraxella bovis</td>
<td>31</td>
</tr>
<tr>
<td>Pasturella multocida</td>
<td>26</td>
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<tr>
<td>Histophilus somni</td>
<td>18</td>
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<tr>
<td>Leptospirosis</td>
<td>5</td>
</tr>
<tr>
<td>Others not listed</td>
<td>5</td>
</tr>
<tr>
<td>Mycoplasmal pneumonia</td>
<td>1.5</td>
</tr>
<tr>
<td>Vibriosis</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Castration methods selected as best option for calves at:

- **Branding**: 99%
- **Weaning**: 61%

97% veterinarians recommend that calves get a tetanus vaccine when banding is recommended as castration method.
Recommended vaccines and practices for calves before weaning

<table>
<thead>
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<td>Leptospira</td>
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<tr>
<td>Moraxella bovis</td>
<td>9</td>
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<tr>
<td>Others not listed</td>
<td>4</td>
</tr>
<tr>
<td>Mycoplasmal pneumonia</td>
<td>2</td>
</tr>
</tbody>
</table>

Anamnestic response?

Tizard, 1996
Weaning

- The most stressful period in the life of beef cattle
- Decrease the stress?????
  - Handle the cattle prior to weaning
  - Soft weaning
    - Fence-line/ 2-stage wean
  - Acclimate cattle to new environment
    - Water bowl/feed trough/new fence lines
    - Prior to weaning?
Parasite Control

- GI Nematodes
  - Injectable/Pour-on/Oral deworming products

- Coccidiosis
  - Be prepared to combat this in weaned calves
  - Coccidiostats/Treatments

- External parasites
  - Flies/ticks