Animal Health Protocols for Raising Dairy Calves

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How to Raise Healthy Calves:

Dairy dependant:
• Born in clean, dry area
• Feed colostrum within 6 hours

Dairy and calf ranch:
• Raise in clean, dry hutch/area
• Feed adequate energy and protein
• Develop rumen
• Vaccinate appropriately
• Use drugs appropriately
Why Protocols?

Protocols are ways to standardize tasks

Written protocols allow:
1) repeatability in response to problems or observations or use of products
2) training of workers
3) Expectation that tasks get done as wanted
4) Review

Protocols

• Understand the management system
• Determine the tasks in the system or area
  – Critical steps
  – Training or education needed
  – Materials
  – Time and timing
• Veterinarians and nutritionists
• Primary language of workers
Areas for protocols:

- Maternity pen
  - sanitation
  - dystocia
- Colostrum feeding
- Holding area
  - sanitation
  - feeding
- Transportation
  - sanitation
  - footing

- Calf processing
  - navel dipping
  - vitamin E/ selenium
  - identification
  - vaccinations?
    - Intranasal IBR
- Handling
- Dehorning
- Castration

Areas for protocols:

- Feeding
  - Water and grain
- Sanitation
- Vaccination
- Recognizing illness
- Treatment
- Euthanasia
- Emergency plans
Maternity pen
  – sanitation
  – dystocia
Must have:
• Clean, dry maternity area
• Proper training for delivery
• Right equipment

Dairy calf raising

• Calves MUST have colostrum
  – *Including bull calves*
• Colostrum has
  – ↑ Energy (fat)
  – ↑ Protein
  – ↑ Antibodies
Colostrum Management:
What Are the Steps in the System?

1) harvesting colostrum from the cows;
2) identifying acceptable colostrum or categorizing the colostrum;
3) storing the colostrum, if necessary;
4) getting the colostrum (and Ig’s) into the calves;
5) monitoring the process.

Colostrum Management:
Harvesting colostrum from the cows

- Clean udders
- Separate milk in bucket milkers
- Clean colostrum
Colostrum Management:
Identifying acceptable colostrum or categorizing the colostrum

The two main strategies are:
1) testing the colostrum
   -- colostrometer
2) pooling colostrum
   The goal is to provide 4 liters of colostrum with at least 50g Ig / liter to the neonatal calf.

Colostrum Management:
Storing colostrum

• Colostrum and milk must be cooled if it is to be stored
• 2-quart aliquots before being put the refrigerator or freezer
• green-zone, yellow-zone or red-zone
Colostrum Management: Feeding colostrum to the calves

Methods dairies use to feed colostrum are:
1) feed two quarts with nipple bottle as soon after birth as possible, and another 2 quarts within 6 hours. Intubate calves as last resort;
2) or: intubate calves with 1 gallon of pooled colostrum soon after birth.

Colostrum Management: Monitoring the process

Ways to test calves for colostrum feeding:
• Total serum or plasma proteins
  – correlated with Ig until about day 6-8
• Zinc sulfate
  – precipitates Ig; turbidity test
• Radial Immunodiffusion
• Commercial kit
• Morbidity and mortality
# Calf Colostrum Monitoring

Dairy: ____________________  Date: ______________

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<th>Total Protein</th>
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<td>TOO LOW</td>
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<td>MINIMUM</td>
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<td>GOOD</td>
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<th>Age</th>
<th>Total Proteins</th>
<th>Classification Too low, Marginal, Adequate</th>
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| GOOD     | /   | = _______ %    |
| MINIMUM  | /   | = _______ %    |
| TOO LOW  | /   | = _______ %    |

**Holding area:**
- Calves must be clean and dry
- Sheltered from sun or weather
- Protected from predators
- Calves must be fed at least every 12 hours
Transportation from dairy to calf ranch:

- Trucks and trailers must be clean
  - Sanitized each day
- Floors must provide good footing with some bedding
- Calves cannot slip and fall onto hard surfaces

Calf processing
  - navel dipping
  - vitamin E/ selenium
  - identification
  - weight?
  - vaccinations?
    - intranasal IBR
Handling

– Workers should be trained in handling calves and cattle
– Gentle
– Don’t drag or pull by ears or tails
– Flight zones for group pens

http://grandin.com/behaviour/transport.html

Housing

Individual housing:
• Must be clean and dry
• Calves must be able to turn around in individual housing
• Consider contagious disease control procedures
Housing

Group housing:
– Must have shelters from weather and sun
– Must be able to lie on dry bedding

Dehorning
– As early as possible
– Pain management
– Local anesthesia if over 3 or 4 months
– Sanitation
Dehorning and Disbudding - Methods

- **Disbudding**
  - Paste/Chemical
  - Cautery
  - Spoon, tube or knife
- **Dehorn**
  - Barnes

Castration
- Perform as young as possible
- 1 to 4 weeks old
- Consider pain management
Feeding

• Water and grain
• Must have clean water every day
• Need grain to develop rumen
• Need grain as alternate energy source
• Monitor body condition

Starter grain

• Key to good rumen development
  • If we are going to underfeed the calves, we had better develop the rumen as fast as possible
• Important because consumption of dry feed is one of the criteria for weaning
• Fresh, dry, clean
  • remove day-old or wet feed, dumping on the ground leads to severe fly problems
• From 1 - 3 days of age feed small amounts and increase the amount as intake increases
Water

- Free choice of water from birth
  - enhances more grain intake
  = earlier weaning
- bacteria in the rumen need water
- If water and milk are fed in the same bucket: rinse bucket first with water before you give fresh water
- Supply a full bucket of water twice a day

Sanitation – buckets, nipples, bottles, people

- Rinse utensils (nipples, buckets, bottles, people)
- Wash
- Rinse
- Dry
Calf Vaccinations

– Develop vaccine program with your veterinarian
– Decide what you want the vaccine program to do for you and the calves
– Make schedule
– Manage inventory
– Handle vaccines properly

Vaccinate appropriately

Purpose of Calf Vaccinations:

• Protect from:
  – Diarrhea?
  – Pneumonia
    • Primarily for group pens
• Efficacy?
• Passive Immunity?
• Vaccine Handling
Handling Vaccines

- Refrigerate
- Do not freeze
- Keep out of sunlight
- Keep cool
- Mix only what will be used in < 1 hour
- Clean syringes
  - Distilled water re: BVD

Calf Vaccinations

Colostrum
- Passive (maternal) antibodies – G.I. And systemic
- Initiates immune system and G.I. enzymes
- Colostrum enhancers: eg: Colostrix, First Defense

Protect from diarrhea:
- Rota-Corona virus: Calf Guard
- “Administer without delay”

Protect from pneumonia:
- IBR: Intranasal vaccine
- MLV IBR, BVD (Types I and II), BRSV
Calves must be growing for drugs and vaccines to work

- Antibodies = proteins
- White blood cells need glucose
- Starvation (negative energy balance) means calf can’t respond to vaccines
- Endotoxins and adjuvants in vaccines can reduce feed intake

Sick Calf Care

- Teach workers to recognize disease
- Develop treatment protocols with veterinarian
- Agree on appropriate drug use
  - AMDUCA regulations
  - Antimicrobial resistance
What Diseases do Young Calves Get?

Tend to be age specific
- Diarrhea
- Septicemia
- Joint infections
- Pneumonia

Average and Range of Ages for Neonatal Calf Diseases

- K99 E. coli
- AE E. coli
- Salmonella
- Coronavirus
- Rotavirus
- Crypto

Age (Days)
What Diseases do Older Calves Get?

- **Pneumonia**
  - BRD – Bovine Respiratory Disease Syndrome
  - Viral upper respiratory infection first
  - Secondary bacterial pneumonia
    - Pasteurella, Mannheimia, Hemophilus
- **Septicemia/ meningitis**
  - E. coli, Salmonella
- **Joint infections/ septic arthritis**
  - Mycoplasma, streptococci

Pneumonia and Septicemia can look similar in calves

Clinical signs: depressed, fever, breathing fast

- Calves with pneumonia breath fast because they have reduced lung capacity
- Calves with septicemia breath fast because they tend to be acidosis
  - Calves with septicemia often develop secondary pneumonia
Basic Treatment of Calf Pneumonia/Septicemia and other Diseases

• Try to use SQ injections
  – Usually reduces pain to calf
  – Reduces tissue injection site lesions

• Use contagious disease control procedures
  – Minimize or eliminate individual oral medications
  – Young to old

Proper injection site
Injection site Lesions/Abcesses

Use oral or SQ routes when possible
  – Be aware of oral pathogens like salmonella
  • Less pain
  • Injection site lesions are problems for meat packers

Why Antimicrobials Don’t Always Work

• Wrong diagnosis
  – Septicemia versus pneumonia
• Wrong drug choice/ dosage/ frequency
  – Under MIC too long
• Starving calf
  – Immune system needs energy
  – Immune system more important in fighting infection than drugs
Why Antimicrobials Don’t Always Work

• Stop treatment too soon
  – General rule is it takes 2-3 days to control infection, 1-2 days more to eliminate it
  – Leaves resistant bacteria, makes re-treat success more difficult
• Start treatment too late
  – Pneumonia tissue walled-off, difficult for drugs to penetrate infected area
  – Organ failure

Basic Treatment for Calf Diarrhea

• Fluids and electrolytes
  – Oral, IV or SQ
  – Commercial products
  – intubation can damage mouth/throat
• Possibly cover with antimicrobial for secondary infections
• Possibly use one dose of flunixin
• Consult with your veterinarian
Basic Treatment of Calf Septicemia

The medical principles are:
• Use drugs that will not hurt the calf (neonate)
  – eg: aminoglycosides, tetracyclines, flunixin are nephrotoxic
• Use drugs that get to the target tissue in sufficient concentrations (MIC)
  – eg: aminoglycosides not well absorbed orally, tetracyclines bound to calcium
  – Blood-brain barrier

Euthanasia

• Death induced while causing no pain or distress to the animal
• Immediate loss of consciousness followed by cardiac and respiratory arrest
• People performing euthanasia must have a good understanding of anatomical landmarks and equipment
Indications for Euthanasia

- Moral obligation to ensure the welfare of animals.
- Euthanasia indicated when quality of life decreased or when pain and suffering cannot be alleviated.
- Must have a euthanasia protocol

Examples of conditions that warrant euthanasia

- Fractures that are not repairable
- Severe pain
- Animal unable to stand and unlikely to respond to treatment
- Poor prognosis/extended recovery
Captive Bolt

- Destruction of brain tissue
- **Proper positioning**
  - Aim captive bolt at center of an “X” drawn between eyes and ears
- Maintenance
  - Must keep clean and working
Confirmation of Death

• Heartbeat -- feel chest to make sure no heartbeat

• Respiration: -- observe calf to make sure not breathing

• Corneal Reflex – touch clear part of eye to make sure no response

Emergency Protocols

• What do workers do in an emergency?
• Must be communicated before the emergency
• Contact names and numbers
• In worker’s language
• Phone available

Examples of emergencies:
• Fire
• Worker injury
• Power outage
• Rapid mortality