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**NEONATAL CALF ASSESSMENT**

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Calf health should be a priority on both beef and dairy farms. Despite this importance, the USDA Dairy 2002 study shows a preweaned heifer calf mortality rate of 8.7% and reports that only 40% of farms can supply an adequate number of replacements from their own herd. Although calf mortality is slightly less in beef calves, 4 to 5% still die prior to weaning. The major diseases of both beef and dairy calves continue to be diarrhea, pneumonia, and septicemia. The purpose of this talk is to give a brief review of the major disease of calves and discuss how they may be treated and prevented.

**Diarrhea-** This is the most common cause of death in young calves and is almost entirely avoidable by good management. The highest risk for diarrhea in dairy calves is from birth until about 1 month of age. Clinical signs begin with loose feces and can progress through dehydration to metabolic acidosis, circulatory shock, and death. Although there are many different pathogens that can cause diarrhea in calves (including E. coli, rotavirus, coronavirus, Cryptosporidium, Salmonella species, Clostridium perfringens type C, and coccidia), veterinarians rarely try to identify the etiology. This is because calves are generally infected with more than one pathogen and the goals of treatment are generally the same regardless of the etiology. In problem herds, a diagnosis might be pursued with fecal and/or intestinal exams in order to institute control programs. Knowing the potential pathogen provides insight into the infection source as well as knowledge on what vaccination, treatment, or disinfection protocols might be effective in reducing the problem.

The most important step in reducing or eliminating calf diarrhea is to make sure the farm has a good colostrum management program. Failure of passive transfer is probably the most common problem I encounter on farms associated with calf health problems. These calves may appear normal but are at increased risk for illness. They also shed pathogens into the environment at a much greater rate than do calves that have had adequate colostrum. Dairy producers should set a goal of 100% of heifers achieving adequate colostrum absorption. The most important aspect of feeding colostrum is volume. Each calf should receive 4 quarts of good quality colostrum. This can be given in one or two feedings but should be completed by the time the calf is 12 hours old. If there is any delay in colostrum administration, the entire 4 quarts should be given at the first feeding. The only way to know there is a colostrum problem is to test the calves for passive transfer. Regular (monthly) testing provides good feedback to the producer on how he is doing with his program. To get an adequate assessment of passive transfer status, at least 12 calves should be tested. Testing can be done as soon as 6 hours after feeding colostrum but no later than 1 week of age. Usually serum total protein concentration is the test of choice and if you use a concentration of 5.5 g/dl as the cut point, there should be no more than 3 of the 12 calves that fall below this value unless there is a herd problem with FPT. For smaller herds, accumulate test results until 12 calves have been sampled.

When a failure of passive transfer problem is identified, the following should be examined as potential causes:

1. unobserved calvings occurring on a regular basis,  
2. calves remain with dam for more than 90 minutes,  
3. colostrum administration occurs more than 4 hours after calving,  
4. calves do not routinely receive 4 quarts of colostrum or not within the first 12 hours,  
5. there is a shortage of colostrum from appropriate donors without a back-up supply,  
6. there is more than a 2 hour lapse between colostrum milking and either feeding or refrigeration of colostrum,  
7. refrigerated colostrum is > 7 days old or frozen colostrum that is > 1 year old or frozen colostrum that has been through more than 1 freeze-thaw cycle,  
8. bacterial contamination of colostrum is excessive (total bacterial count > 1,000,000 cfu/ml and/or fecal coliform count > 10,000 cfu/ml),  
9. colostrum is routinely pooled,  
10) fresh cow health is poor, or 11) transition cow management (nutrition, group changes, bedding, density, vaccinations, medications) is a concern.

Contamination of colostrum and/or milk/milk replacers can also be a problem leading to diarrhea in dairy herds. Common sources of contamination include infected quarters, inadequate cow preparation at the time of milking, poorly sanitized milking equipment, or storage without adequate cooling. Milk and milk replacers can also be contaminated by people or from the feeding equipment (bottles, buckets, delivery equipment, etc.). Colostrum and/or milk/milk replacers can be cultured when suspected problems exist. Dr. Sheila McGuirk at the University of Wisconsin has recommended the following goals for milk and milk replacers fed to calves: total bacteria count less than 10,000 CFU/ml, fecal coliform count of 0 CFU/ml, coagulase negative Staphylococcus counts less than 5,000 CFU/ml, and gram-negative bacterial counts (other than coliforms) less than 5,000 CFU/ml. Although the importance of bacterial contamination hasn’t been emphasized much in the past, we are beginning to realize what an important cause of calf diarrhea this has become.

**Milk replacer problems** - Lately I have seen several problems in farms that have adopted “accelerated feeding” programs for their dairy calves including ileus, bloat (rumen or abomasal), enterotoxemia, and neurologic signs. Many of these problems come from an increase in osmolality and sodium concentrations of these intensive milk replacers compared to whole milk or a conventional milk replacer. Blood and whole milk have an osmolality of 280 to 290 mOsm/L while some of the newer milk replacers have osmolalities greater than 600 mOsm/L. The increased osmolality rates lead to changes in gastric motility and emptying rates that may cause problems. Also the increased sodium concentrations (> 120 mEq/L) in some of these products may cause hypernatremia. Although these “accelerated feeding” programs are used successfully on some herds, the calves must genetically be capable of handling the increased protein and fat concentrations. These programs are certainly not appropriate for all farms.

**Pneumonia** - This condition refers to an inflammation of the lungs which is most commonly caused by either Mannheimia hemolytica, Pasteurella multocida, or Mycoplasma bovis in calves. Clinical signs of pneumonia...
include nasal discharge, dry cough, rectal temperature greater than 103.0°F, dyspnea, and/or decreased appetite. Calves that develop pneumonia prior to weaning frequently share the same risk factors as for diarrhea including failure of passive transfer, prolonged exposure to adult cattle, and/or poor ventilation. As with diarrhea, an etiologic diagnosis is rarely pursued as multiple pathogens are often involved. Antibiotic and anti-inflammatory therapy is generally indicated. Because of the significant impact that dairy calf pneumonia can have on the future productivity of that heifer, early identification and treatment is important. Calves that develop chronic pneumonia seldom recover completely and should be culled.

**Septicemia** - This is another possible sequella to failure of passive transfer and remains a major cause of mortality in calves less than 14 days of age. The bacteria that cause septicemia in calves (often *E. coli* or *Salmonella*) are difficult to treat, and the prognosis is generally poor. Initial clinical signs can include progressive lethargy, depression and inappetence. Heart rate, respiratory rate, and temperature are sometimes elevated, but this is not always the case. Abdominal distension due to ileus might be present as well as diarrhea +/- mucous. The presence of multiple sites of infection (polyarthritis, uveitis, meningitis, omphalophlebitis) is generally considered diagnostic. A diagnosis is most often made by history and physical examination. The presence of FPT is highly suggestive of sepsis in a calf with appropriate clinical signs. A CBC may confirm the severity of the septicemia but it has no prognostic value. Blood cultures can be attempted on valuable animals but are not cost-effective for routine use. Treatment of septicemic calves should be approached with caution as the cost of treatment is expensive and the overall prognosis is often poor. Broad spectrum bactericidal antibiotics should be given parenterally along with non-steroidal anti-inflammatory drugs and intravenous fluids. Blood glucose should also be monitored as septicemic calves have a tendency to become hypoglycemia and remember to treat secondary infections as necessary (ie. umbilical resection, joint lavage, etc).

**Neonatal Calf Assessment** - Successful treatment of sick calves depends on early identification of problems. On some beef or dairy farms with a high incidence of disease the following can be recommended as monitoring criteria for calf health. When any of the following are identified, treatment should be instituted.

1) Early morning rectal temperature (taken at the same time every day for the first 1 to 2 weeks of life) – if the temperature exceeds 103°F for 2 consecutive days OR if it is accompanied by slow, reduced or no milk intake
2) Slow, reduced or no milk/milk replacer intake
3) Watery and/or bloody diarrhea
4) Cough, nasal discharge or labored breathing
5) Head tilt, umbilical or joint swelling
6) Weakness, inability or reluctance to rise
7) Lameness