Critical Care of the Production Animal Patient

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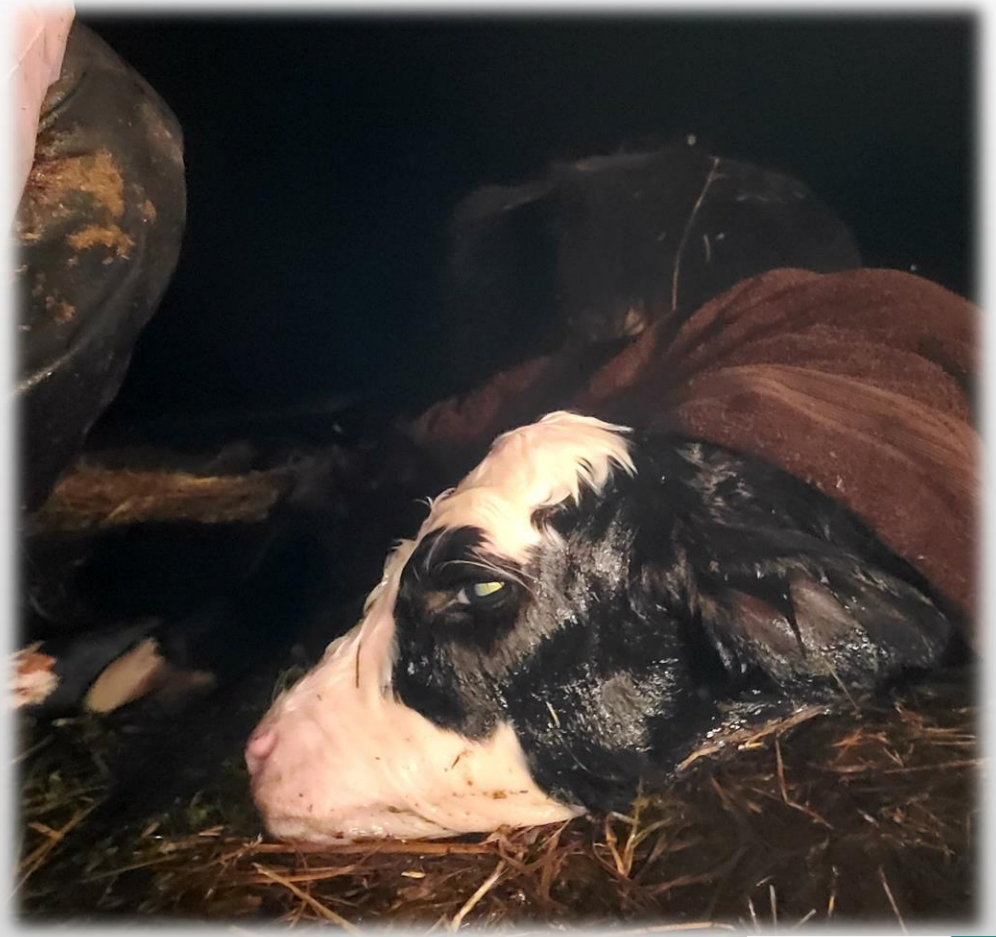
Dystocias

Prolonged birth due to

- Dam with a small pelvic area
- Large calf/kid/lamb/piglet size
- Abnormal presentation
- Poor cervical dilation
- Uterine torsion
- Prolonged second-stage labor
- Multiparous
- Metabolic imbalances



Caring for the Dam

Near parturition and following a dystocia, dams may have birth related traumas and medical conditions.

- Nerve or muscle damage can occur from prolonged recumbency or difficult birth. We can provide supportive care with slings to assist the patient in regaining function.
- Milk fever (hypocalcemia) and pregnancy toxemia (sheep) in the multiparous patient are common metabolic conditions related to parturition which require medical interventions to correct the patient's metabolic state.

Caring for the Neonate

- Calves, lambs, kids and piglet that enter this world following a difficult birth typically have reduced performance.
- They are often times weak, slow to stand, lack vigor, and nursing is delayed.
- Apnea is evident if a spontaneous breath is not taken within 1-3 minutes following birth.
- Respiratory acidosis is something neonates come with to a degree after the birthing process. A dystocia can certainly exacerbate the condition, and the patient may need resuscitation.
- Respiratory acidosis is when there are high levels of C02 that are unable to leave the lungs, and not enough oxygen going into the lungs. This typically occurs shortly after the umbilical cord breaks free after birth.
- If calves do not immediately gasp for air after birth, prolonged oxygen deprivation can cause a rapid decline in the patient and, ultimately, death unless there is an intervention with supplemental oxygen.

Stimulating Respiration

Methods to stimulate or increase respiration

- Tickling the neonate's nasal passages with a piece of straw
- Use a bulb syringe to clear the nasal passage
- Inserting a finger in the neonate's ear
- Pour cold water over the head can stimulate a gasp reflex
- Acupuncture point with a 20g needle in the middle of the nose to stimulate the CNS to promote and increase responsiveness, respiration, and heart rate.

Birth Trauma

Birth-related trauma in can result in perinatal morbidity and mortality. Forced extraction can exacerbate these conditions. Using a half hitch above and below a joint when applying chains to limbs can help distribute pressure evenly to avoid injury to limbs.

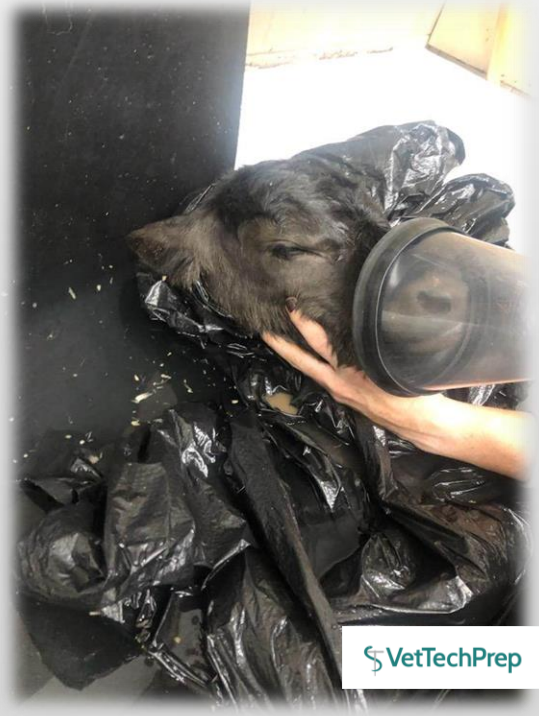
- Swollen heads
- Swollen tongues
- Fractured ribs
- Fractured limbs

Thermoregulation

- Interventions for the hypothermic patient is critical, especially in extremely cold temperature environments.
- A normal rectal temperature should be around 101.5-102.5 F.

Methods to promote thermoregulation include:

- Warm water bath submersion
- Heat lamps
- Towels & blow dryer
- Manual stimulation



Importance of Colostrum Consumption in Neonates

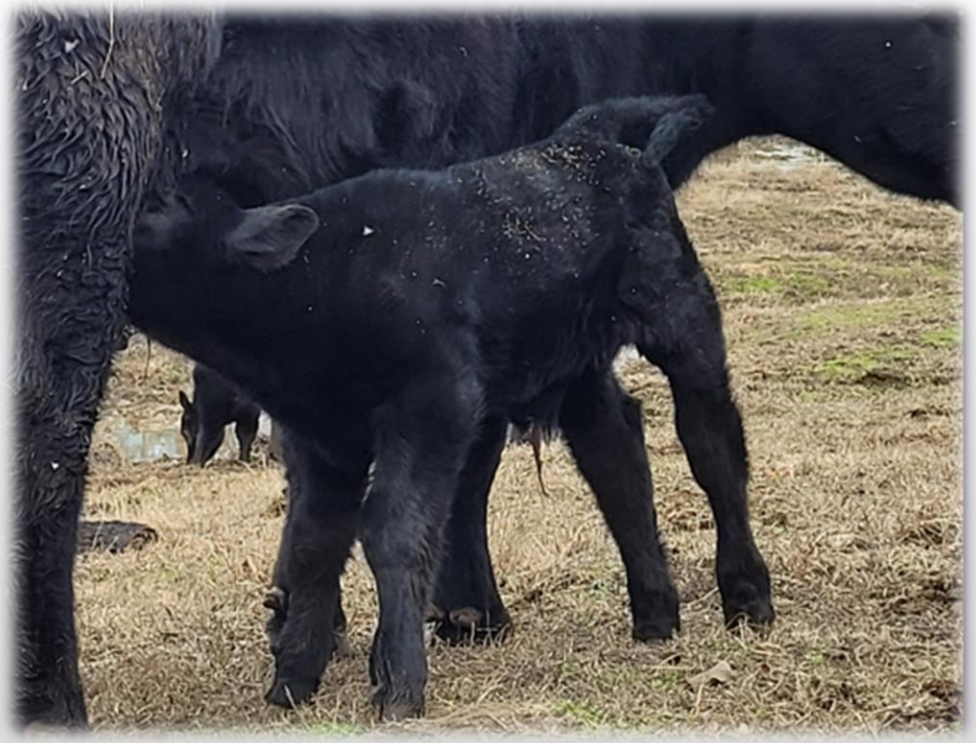
- Maternally derived colostrum is essential in assisting the patient in developing a strong immune system because ruminants have an epitheliochorial placenta that separates the fetus and the dam's circulation.
- This prevents immunoglobulins from transferring to the growing fetus, in turn making a calf's immune system inefficient at birth until colostrum is consumed and absorbed.
- Inadequate colostrum quality or quantity results in a failure of passive transfer, which is a known precursor to a poor-functioning immune system.
- Colostrum should be consumed within the first 6-12 hours of life. Calves should stand and consume colostrum ideally within the first 1-2 hours of life; if a calf has not stood on its own and nursed within 4 hours, replacement colostrum may be warranted.

Measuring Passive Transfer

- Radial immunodiffusion and the enzyme-linked immunosorbent assay (ELISA) are used to measure serum IgG concentration to evaluate passive transfer directly. This is considered the gold standard. A serum IgG of 18-24.9g/L is considered to be adequate IgG levels for successful passive transfer.
- Serum total protein evaluations of calves with failure of passive transfer are typically less than 5g/dl. This can be performed stall side with quick results and is extremely affordable to complete.
- If calves are less than 12 hours old with a serum total protein of less than 5g/dl, colostrum replacement is warranted.

Colostrum Replacement Options

- Fresh from the dam
- Fresh or frozen from donor
- Fresh or frozen from dairy
- Commercially available product

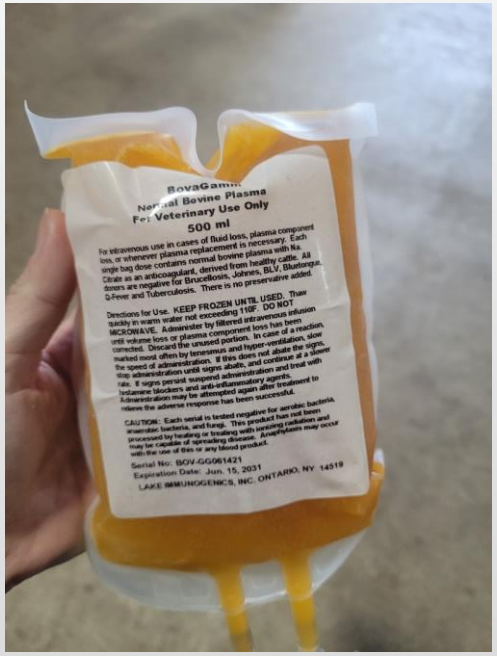


Delivery Methods

- Bottle
- Nasogastric tube, orogastric tube or esophageal feeder
- 300-400g of IgG in the first 24hrs.

Plasma Transfusions

- If neonates are more than 12 hours old with a serum total protein of less than 5g/dl, a plasma transfusion is warranted.
- Frozen plasma should always be warmed slowly in warm water prior to administration. Always use a filter set to administer the product.
- Serum total protein or ELISA IgG should be measured 4-12 hours post-plasma transfusion to evaluate the success of the procedure.



Patient Monitoring During Plasma Transfusions

- Closely monitor your patients during transfusion for a reaction.
- Change in Pulse
- Change in Temperature
- Change in Respiratory Rate
- Trembling
- Hives
- Give the first 50ml of plasma slowly and then increase over time. Approximately 1L of plasma can be delivered over 30-45 minutes.
- Have Epinephrine prepared in case of a reaction.

Nutritional Considerations

- High-quality milk replacer or whole milk should be provided at approximately 10-15% of body weight per day after initial colostrum consumption.
- If neonates will not suckle or lack vigor an esophageal feeder can be used.
- If prolonged feeding is anticipated a nasogastric tube can be placed to prevent repeated trauma from an esophageal feeder.
- Care must be taken to ensure that patients are in sternal recumbency or standing to limit the potential for regurgitation and aspiration into the lungs.

Fluid Therapy

- Supportive care with oral electrolyte therapy is most commonly indicated in mildly dehydrated patients.
- Oral electrolyte products that contain acid buffers or alkalizing agents are used to prevent or correct acidosis.
- Acidosis is common in dehydrated and scouring calves, kids and lambs from the depletion of sodium. Use oral electrolyte products that contain sodium bicarbonate, acetate, or propionate as alkalizing agents. Ideally, it is best to administer oral electrolytes separate from milk feedings.
- If the patient has a severe fluid deficit, the replacement fluids need to be done 2 hours, separate from milk feedings. This helps promote abomasal emptying and prevents abomasal bloat the debilitated patient.
- Patients with severe diarrhea and dehydration often have low sodium, a low pH (acidosis), and an elevated d-lactate with a negative energy balance.
- Supplemental energy may be required in severely debilitated patient with oral glucose and glycine to help promote glucose absorption. Total parental nutrition with proteins, dextrose, and lipids may also be indicated.
- You will typically want to avoid lactated ringer solution on patients with diarrhea and dehydration if they have an elevated d-lactate.
- Hypertonic saline +/- sodium bicarbonate may be a better choice to address the fluid deficit and acidosis.

Fluid Therapy

- Here's how to calculate a calf's needs:
  - Weight of calf multiplied by dehydration percentage = lbs. of fluid lost, then
  - Pounds of fluid lost divided by 2 = quarts of fluid lost
  - Quarts of fluid lost is then divided by 2 = fluid replacement needed in quarts

  For example, if a 100 lb. calf is estimated to be 8% dehydrated, it will have lost 100 x 0.08 = 8 lbs. of fluid. This is equal to 4 quarts of fluid needed for total replacement in addition to regular feedings.

- Similarly, if we were to administer IV fluids, we would administer a total replacement of 3.6L.

- 45kg multiplied by 0.08=3.6L