Top 5 bovine emergencies - solved!

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Abstract

Veterinarians face dynamic and changing situations daily as a matter of routine, but life-threatening emergencies on large animals can really take a toll, especially to the new graduate. Here, we will cover five common emergencies presented to bovine veterinarians: bloat, down cow, dystocia, uterine prolapse, and the down neonate.

Key words: emergency, dystocia, uterine prolapse, bloat, down cow, neonate

Bloat

Clients often use the term "bloat" to refer to any type of abdominal distention, but because of the life-threatening nature of rumen tympani, it is appropriate to respond to these calls quickly. Useful information to gain while on the phone with the owner include the apparent tightness of the upper left quadrant of the abdomen, how the animal is breathing, and what the diet is.

True rumen bloat may be either free gas or frothy in nature. Free gas bloat occurs as a result of excess readily fermentable carbohydrate ingestion, intraluminal esophageal foreign body or extramural compression of the esophagus, perhaps by mediastinal lymph nodes. Frothy bloat is associated with legume or wheat feeding and with some rich finishing diets.

Initial evaluation of the bloated animal should include determining whether or not the animal is in respiratory distress and how tight the rumen is. For animals not severely distended or distressed, passing of a stomach tube, either orally or nasally, is appropriate. Passage of a tube can rule in or out esophageal obstruction and relieve free gas bloat quickly. In cases of frothy bloat, the bloat will often minimally reduce and when the tube is removed, it may contain a column of foam. Cases of frothy bloat tend to be less severe than free gas bloats.

For the animal in distress or very tight, immediate placement of a rumen trochar may be indicated as passage of a stomach tube can be stressful and further compromise oxygenation. Various types of trochars are available, but self-retaining (corkscrew) trochars are inexpensive, easy to use, and hold in the body wall for bloat relief over days to weeks. Initially, make a stab incision through the skin at the highest point of the rumen distention. Then, thrust the trochar and cannula (end cap removed) forcefully and quickly into the rumen and begin to twist clockwise until the external washer of the cannula is tight against the skin. For animals with thin body walls, it may help hold the cannula tightly by wrapping brown gauze around the shaft between the washer and the skin. The center trochar is then pulled and the bloat relieved.

Once the initial crisis is over, the cause(s) of the bloat need to be determined and corrected. In cases of free gas bloat due to grain overload and acidosis, alkalinization of the rumen with magnesium oxide or magnesium hydroxide, transitioning to a forage-only ration for a time, and transfaunation, are helpful in recovery. In cases of extreme feed overload, rumenotomy may be warranted and, in cases of chronic bloat, rumenostomy may be necessary to provide longer-term bloat relief. In cases of frothy bloat, administering paloxalene or other surfactants help to dissipate the froth and are most effective when diluted in a pint of water and administered at the level of the cardia of the rumen. Transition to a non-legume forage diet with slow transition back to the target diet should occur.

Down cows

Cattle that are recumbent almost always have severe disease; prey animals do not choose to not stand up. Unfortunately, there are many potential causes of recumbency and these animals can be difficult to adequately examine. When initially speaking with the owner of a down animal, it is important to have them prop her up on her chest (sternal recumbency) to prevent fatal bloat and to determine how long she has been down, if she is eating and drinking, and her production status (did she calve recently?).

On arrival to the farm, ensure that the animal is stabilized in sternal recumbency and evaluate the mental status. A quick physical exam including body condition score, mucous membranes, heart rate, lymph nodes and temperature should be performed, followed by more specific examination aimed at the "6 Ms" of down cows: mastitis, metritis, major sepsis, metabolic, musculoskeletal/neurologic and mystery causes.

Mastitis and metritis caused by coliform, *Staphylococcus aureus* and environmental streptococci can cause toxemia and severe metabolic derangements. Causes of massive sepsis include pleuritis, enteritis, endocarditis and peritonitis from uterine tears, abomasal ulcers, and hardware disease. Metabolic disease in the form of protein-energy malnutrition or deficiencies in calcium (recumbency at <5 mg/dL), magnesium (recumbency at <1.1 mg/dL), potassium (recumbency at <2.5 mg/dL) and phosphorus (recumbency at <1.0 mg/dL) is common. Fractures, luxations and muscle or tendon tears are common musculoskeletal findings and may be the primary cause of recumbency or may occur from overzealous attempts to get the animal to stand. Spinal disease from trauma or lymphosarcoma and peripheral nerve damage such as obturator nerve (calving) paralysis are common neurologic causes of recumbency.

It is critical to determine if the condition of the animal is treatable or not. If it is, then institute treatment and the owner should shelter animal sheltered, feed and water her until she has the opportunity to respond. If the animal's condition is dire or is not treatable within reasonable time, financial or medical parameters, inform the owner of that and recommend euthanasia. In situations where owners refuse euthanasia, shelter the animal, provide with readily accessible feed and water, give analgesic medications and provide electrolytes, oral feeding, etc., for support and comfort. It is not recommended to give 50% dextrose boluses as they are associated with reductions in available phosphorus and potassium.[4,12] Provide the owner

with specific monitoring and decision parameters. AABP's documents "Care and Disposition of Non-Ambulatory and Injured Ambulatory Cattle" and "Guidelines for the Humane Euthanasia of Cattle" are useful to guide animal welfare decisions.[1,2]

Dystocia

There's almost nothing more rewarding in food animal practice – and more potentially stressful and heartbreaking – than dystocia. Every calf is the culmination of a minimum of a year of inputs and often years of genetic planning and development.

Critical information to gain during the initial phone call include how long the heifer or cow has labored, whether or not someone has done an internal exam, and what their impressions were, and always ask the owner to catch her up before you get there and have warm water available.

When arriving on the scene, first evaluate the dam's status and how she's restrained (or not). Your safety comes first. If she is not in a method of restraint that keeps you and her safe, establish a safe situation first. My preference is not to pull calves with cows in a head gate, but it can be appropriate to evaluate them in a head gate and keep them there through chain placement. Some like for cattle to be down during calving and that is the personal choice of the veterinarian whether or not to cast them down if they are standing.

Not all veterinarians agree about providing epidural anesthesia, but I always do. A caudal epidural only anesthetizes the pelvis and the perineum and therefore will not stop a cow from pushing to assist you with the delivery. For caudal epidurals, I use 2% lidocaine at 1mL/200#, but do not exceed 6mL total in any animal due to the risk of ataxia. For fractious animals, xylazine at 0.03 mg/kg can be added to that epidural but it is important to be aware of the effects of xylazine on diminishing oxygen delivery to the uterus and calf,[5] as well as sedation of the calf. At this point, I place a tail tie on the cow and disinfect and clean the vulva. Then, it is important to do a systematic evaluation. Is the cervix open? What parts are coming? Do the limbs that are coming go together? Is the calf moving? Is it moving too much? I do not ever commit to a live calf even when I feel movement and I never use oxytocin pre-delivery as it is contraindicated in obstructive dystocia, which almost all bovine dystocia are.

They key to dystocia success is to work at a steady pace because it's easy to get frustrated. Remember, the longest delay in getting the calf out came prior to you being called, not the time you are working. Often, contraction of the uterus limits fetal manipulation. I find that 5-10mL of epinephrine IM can help relax the uterus and, along with distending the uterus with lube, can create the room you need to correct a malposition. Water-soluble lube must be used, not J-lube, which is toxic if it gets into the abdomen.

As you work, determine where the holdup is. Is it the pelvis, cervix or vulva? In most situations, it is the pelvis, which unfortunately is the most difficult to overcome. If it is the vulva, however, an episiotomy may be performed. Cervical dilation may be achieved with manual manipulation.

All calves born of dystocia are high risk, which is worsened by prematurity/dysmaturity, induced parturition, meconium staining, etc. After delivery, be sure to address the calf's need for oxygen, colostrum and navel care.

After delivery, examine the dam for "spares and tears". No matter how big a calf is, he's not too big to have a twin. I usually administer 2-5cc of oxytocin to help with uterine contraction and milk letdown. Antimicrobials are indicated in a complicated dystocia, particularly where the calf is dead. NSAID therapy is indicated. Flunixin has been shown to increase retained fetal membranes and metritis[8], while meloxicam did not increase these conditions when administered post calving[7].

Uterine prolapse

I maintain that a uterine prolapse is the worst thing that can happen to a cow. It is critical that uterine prolapses be correctly identified at the initial phone call as they are absolute emergencies. Affected heifers and cows should also not be transported. Table 1 is a chart that can be helpful to use with staff to correctly identify and triage prolapses over the phone.

Instruct owners to restrain the cow in preparation for your arrival, gather warm water, and cover the prolapse if the cow's disposition will allow that.

On arrival, I tend to leave standing animals standing and recumbent animals down to replace the prolapse. Many animals with uterine prolapse are often systemically unstable, but my approach generally is to replace the prolapse and then work to stabilize as, through the uterus, there is a lot of heat and fluid loss. In recumbent animals, place them in an extended frog-leg position, which tilts the pelvis forward to facilitate replacement. Administer a caudal epidural. Examine the uterus for full thickness tears and then focus on washing the uterus and removing the large debris. It will never be clean and rapid replacement should be a priority. In recumbent animals, I will place a large trash bag under the uterus for washing and then pull that close to or onto my lap for replacement.

When replacing the uterus, it is important not to push with your fingertips as the uterus is very friable. I tend to push with my fists, starting at the most proximal portion of the uterus. Oxytocin is contraindicated for shrinking the uterus here, as it makes the uterus very firm and flaccidity is needed for replacement. Once the uterus is completely inside, it is important to ensure that the uterine horns are fully everted or else reprolapse is inevitable. Blunt arm extensions like soda bottles can be used to ensure the tips are everted. Filling the uterus with water to facilitate eversion is risky due to the risk that there are unidentified uterine tears with communication to the abdomen.

In cases where there is substantial damage to the uterus, uterine amputation is indicated for salvage. Dorsally, make an incision through the uterine wall to replace the bladder and any other viscera trapped in the prolapse back into the abdomen. Then, place IV tubing or a large castration band around the uterus close to the vulva and tighten. Alternatively, place multiple crushing sutures (modified horizontal mattress) to ligate the uterus and blood supply. Then, amputate the uterus distal to the band or sutures and replace.

In non-amputation cases of uterine prolapse, I always place a Buhner suture to help ensure reprolapse does not occur. Additionally, I administer fluids and electrolytes, oxytocin, an antimicrobial (if it is not a salvage) and a NSAID. There have been many studies for the prognosis and reoccurrence rate for uterine prolapse in both beef and dairy cattle.[3,6,9,10]

Table 1: Chart to facilitate support staff communication with clients regarding prolapse triage.

Prolapses			
Vagina	Smooth	~ Volleyball sized	Non emergency - need appt
Cervix	Wrinkled	~ Volleyball sized	Non emergency - need appt
Uterus	Covered in buttons	Can be small - 2' long	EMERGENCY - farm call ONLY

Down neonate

There can be many reasons for the "dishrag", down neonatal calf including hypoglycemia, hypothermia, sepsis, acidosis or congenital defects. Knowing the age of the calf, whether or not it was born to dystocia, if it has any suckle response, if it's scouring, when it last nursed and its temperature are all valuable when preparing to see the case.

During an initial, quick exam, I will place my finger in the mouth to assess suckle and temperature, mental status and rectal temperature. Blood glucose can be quickly run on a POC analyzer. The Precision Xtra® has been validated in cattle.[13] If available, intranasal oxygen can be beneficial and an IV catheter should be placed.

For hypothermic calves, truck floorboards, heat lamps, hot boxes, heating pads (use with very close monitoring only), and warm water baths may be used for warming. In one study of lambs, a warm water bath resulted in the most rapid warming with the least metabolic cost to the lamb.[11] We place babies in trash bags with their head out and place them in a water bath to keep them dry.

The drug and fluid formulary I use for neonates is found in Table 2.

References

1. American Association of Bovine Practitioners. Care and Disposition of Non-ambulatory and Injured Ambulatory Cattle, 2020 Apr. **http://aabp.org/Resources/AABP_Guidelines/non-ambulatory2020.pdf**

2. American Association of Bovine Practitioners. Guidelines for the Humane Euthanasia of Cattle, 2019 Aug. **http://aabp.org/Resources/AABP_Guidelines/EUTHANASIA-2019.pdf**

3. Gardner IA, Reynolds JP, Risco CA, Hird DW. Patterns of uterine prolapse in dairy cows and prognosis after treatment. *J Am Vet Med Assoc* 1990;197:1021-1024.

4. Grunberg W, Morin DE, Drackley JK, Constable PD. Effect of rapid intravenous administration of 50% dextrose solution on phosphorus homeostasis in post parturient dairy cows. *J Vet Intern Med* 2006;20:1471-1478.

5. Hodgson DS, Dunlop CI, Chapman PL, Smith JA. Cardiopulmonary effects of xylazine and acepromazine in pregnant cows in late gestation. *Am J Vet Res* 2002;63:1695-1699.

6. Jubb TF, Malmo J, Brightling P, Davis GM. Survival and fertility after uterine prolapse in dairy cows. *Aust Vet J* 1990;67:22-24.

7. Newby NC, Renaud D, Tremblay R, Duffield TF. Evaluation of the effects of treating dairy cows with meloxicam at calving on retained fetal membranes risk. *Can Vet J* 2014;55:1196-1199.

8. Newby NC, Leslie KE, Putnam Dingwell HD, et al. The effects of periparturient administration of flunixin meglumine on the health and production of dairy cattle. *J Dairy Sci* 2017;100:582-587.

9. Patterson DJ, Bellows RA, Burdening PJ. Effects of Caesarean section, retained placenta and vaginal or uterine prolapse on subsequent fertility in beef cattle. *J Anim Sci* 1981;53:916-921.

10. Richardson GF, Klemmer AD, Knudson DB. Observations on uterine prolapse in beef cattle. *Can Vet J* 1981;22:189-191.

11. Robinson JB, Young BA. Recovery of neonatal lambs from hypothermia with thermal assistance. *Can J Anim Sci* 1988;68:183-190.

12. Wagner SA, Schimek DE. Evaluation of the effect of bolus administration of 50% dextrose solution on measures of electrolyte and energy balance in postpartum dairy cows. *Am J Vet Res* 2010;71:1074-1080.

13. Wittrock JAM, Duffield TF, LeBlanc SJ. Short communication: Validation of a point -of-care glucometer for use in dairy cows. 2013;96:4514-4518.

Table 2: Neonatal formulary for calves.

Neonatal formulary			
Drug	**Dose**	**Route**	**Comments**
Bicarbonate	1-2 mEq/kg	IV	Crisis dose
Dexamethasone	0.05-0.1 mg/kg	IV, IM, SC	
Dextrose	1 mL 50%/10#	IV	Crisis dose
Doxopram	0.125-0.25 mL	IV or IM	
Epinephrine	0.1-0.2 mL/kg	IV, IM, IC	1:1000
Fluids	60 mL/kg	IV	Shock dose
Furosemide	1-2 mg/kg	IV	
Mannitol	0.5-1 g/kg	IV	Over 20-30 minutes
Pred. sodium succinate	1 mg/kg	IV, IM, SC	
Tolazoline	2-4 mg/kg	Slow IV, IM, SC	For reversal of xylazine administered to dam
Yohimbine	0.1 mg/kg	Slow IV, IM, SC	For reversal of xylazine administered to dam