

Bovine Dystocia Management

This session will discuss normal labor and how to identify when a dystocia is occurring in a ruminant, as well as when it is necessary to intervene to aid delivery of the calf. Instruction for proper handling of the cow and restraint will be discussed to aid in a safe working environment. Additionally, common malpositions and postures will be covered, along with how to correct them, if possible. Situations where vaginal delivery is not able to be facilitated will be identified, and cesarean section and fetotomy will be reviewed.

Speaker Bio:

Dr. Jessica Rush grew up in rural Alabama working on her uncle's family farm. During this time, she developed a great love for cattle and reproduction. She received a BS in Animal Science from Auburn University followed by her DVM from Auburn University College of Veterinary Medicine in 2010. Following graduation, Dr. Rush accepted a position in a rural mixed animal practice in Ashland, AL. After 5 years in private practice, she returned to Auburn University College of Veterinary Medicine as a Theriogenology resident in 2015. Following completion of the residency program and achieving board certification by the American College of Theriogenology in 2018, Dr. Rush accepted a position as Assistant Clinical Professor at Auburn University College of Veterinary Medicine of Food Animal Medicine and Surgery. Since becoming part of faculty, Dr. Rush works to further develop the urogenital surgery service. She enjoys training the AU CVM palpation team and devotes a large amount of extra time to these students. She serves as the faculty advisor for the AU AABP club. Her research interest includes bovine reproduction and beef cattle health with emphasis on venereal diseases and infertility, particularly in the bull.

Learning Objectives:

1. Determination of when a cow is having a dystocia and when to intervene to administer assistance
2. Education of client/producer about when to seek veterinary assistance
3. Proper manipulation and correction of malposition or malposture to facilitate delivery of calf

References:

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2. Drost, M., Dystocias and accidents in gestation. pp. 409-415 In Bovine Reproduction 1st edition. Hopper. 2015 Wiley and Sons.
3. Walters, K., Obstetrics: Mutation, forced extraction, fetotomy. pp 416 – 423 In Bovine Reproduction 1st edition. Hopper. 2015 Wiley and Sons.
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[00:00:05.11] Good evening, everyone. Thank you so much for joining us tonight. I'm Katie Krothapalli, director of Healthcare Education from Edcetera. I'm very excited to welcome Dr. Jessica Rush tonight. She's actually one of my classmates and a really good friend. And she-- all things bovine [LAUGHS] is her specialty. She's a board certified theriogenologist. And I know you're going to enjoy her lecture. We're really excited to get our bovine content kicked off here.

[00:00:31.43] So with that, I will hand it off to her. Thanks.

[00:00:35.59] Good evening, everyone. As Katie was saying, I am a [INAUDIBLE] theriogenologist at Auburn University currently. I spend most of my time dealing with cattle. So bovine dystocia is something that we deal with a lot, especially in the Southeast.

[00:00:54.25] Some of the-- [INAUDIBLE]. Some of the things that we deal with when we think about learning objectives on how to deal with this is remembering and reviewing what is normal. What is normal behavior? What are the normal stages of labor?

[00:01:09.98] And then being able to recognize when a dystocia is occurring. How long to give an animal during labor before deciding to assist? And then what is the management and correction of the ruminant dystocia that can help as you go through this?

[00:01:26.72] Remember, when we're talking about normal parturition, behaviors that we are-- let us know that parturition is about to occur. Obviously, cattle separate themselves from the herd. Often, they lie down a lot, get up, lie down.

[00:01:42.30] A few days before, you can have some decreased appetite. The mucus plug can also start to shed a few days before, sometimes, up to a week in some of the dairy cows. And then that vulvar edema, relaxation of those sacrosciatic ligaments up around the tail head, and an enlarged udder, or all signs that we're getting close.

[00:02:06.89] Remember that stage one is just the initiation of labor. And that can take anywhere from 4 to 12 hours. And when we really think about this, we really think about cervical dilation and the removal of the progesterone block on the uterus so that it's able to contract again.

[00:02:24.56] And late term gestation, we have that switch from progesterone being the main hormone produced back to estrogen, to help that uterus contract. So we're going to remove that block right there in first stage labor.

[00:02:39.08] Second stage, this is going to be delivery of the fetus. 30 minutes to 4 hours. I would think, in most cases, four hours is a little long, but you will read that number out there. My safety zone is about one hour. If I'm sitting here, working on it for more than 30 to 45 minutes, she definitely needs some help.

[00:03:00.80] And then stage three is just when we expel those fetal membranes. And that typically takes about 8 to 12 hours at the most. Most of them have it out within 30 minutes to an hour. And remember that any time we're dealing with a dystocia, you're going to have an increased incidence of retained fetal membranes, as well as some potential straining afterwards to deal with.

[00:03:28.73] And remember that we call it a retained placenta truly when it's been attached for more than 12 hours. So these are things that we need to remember as we go through.

[00:03:40.99] When did the producer need to ask for help? This is something that you have to educate your clients and have that relationship with them, so that they're watching, they know what your expectation is of when they need to intervene, and that kind of thing. So I usually like to tell my clients, but when are you going to call it a dystocia, if that calf is not delivered within 30 minutes to 60 minutes of when you see you're in labor-- in active labor.

[00:04:11.73] A good mature cow that is multi pairs had multiple calves, she's going to be done in probably about 30 minutes. She's not going to have trouble. She may not even lie down. A heifer, probably going to rock on around more so 60 minutes. They don't really know what's going on. This is their first time to deal with this. Sometimes, they take a little break. They get a little confused. They have a few more issues of getting things out.

[00:04:40.93] So I usually say, if it takes a heifer more than 60 minutes to get the calf out, she's needing some assistance. And then of course, you say this. This was sent to me by one of my clients. Recently, one of my producers, we've just got fetus hanging out, cows just going about her business, going back to the herd. She definitely needed some help that day.

[00:05:02.82] I try to train my clients to know not only when to intervene, but how long after they've intervened do they need to call me. 30 minutes is my rule, regardless. If they've made no progress in pulling a calf in 30 minutes, they need to call me. Because that's also my rule for myself. When I'm working on a dystocia, if I don't make progress in 30 minutes, I need a new plan. What I'm doing is not working.

[00:05:32.29] And it's a good idea to have somebody else who's there to be your stopwatch, because it's amazing how time is just-- a novel idea when you get to work in this hard, you don't realize how much time passes. And so having somebody else keep up with the time for you can be very helpful.

[00:05:50.38] Some of your clients will be very proficient at pulling calves. So you know that it's going to be pretty bad when they call you. And so I always tell them, don't work more than 30 minutes without giving me a call.

[00:06:03.97] Facilities are a must. You have to have a safe situation to do this. You can do this in some relatively simple facilities. But most of the time, you need a head catcher, or a shoot, a halter, some ropes. You need to be prepared.

[00:06:19.18] I'm one personally, I don't necessarily like to work on dystocias in a regular shoot. A head catch is fine. But most of them are slanted in at the bottom. And if she was to go down, it can be hard to get her out. And then of course, there's more pressure on her as you're working, if she won't get up.

[00:06:41.12] So sometimes, I just run them through the shoot to put a halt around in time off to something, and let them out, and I move with her. I really like an alleyway. That way, if she lays down, it's not narrow at the bottom, it's the same depth. And I don't have to worry about her getting wedged in or putting extra pressure on her where it inhibits my ability to get in there and move.

[00:07:04.87] We need to remember in normal parturition, what is orientation of that fetus. We talk about-- [CLEARS THROAT] excuse me-- the three Ps, which are presentation, position, and posture. The presentation is going to be the fetal orientation in relation to the spinal axis of the dam. So is it come in? Is that calf coming cranial, where the head's coming first, caudal, where the tail is coming first, or transverse? Transverse, you're going to be presented with either the abdomen and all four legs, or the backbone.

[00:07:37.84] The position there, we're dealing with the fetal orientation by the relation of the calf's dorsum to the calf's pelvis. So where is this back of this calf in relation as it enters the pelvis to the dam's pelvis? So the dorsum of the calf to the sacrum, dorsosacral, dorso ileal, the dorsum of the calf to the cow's ileal wings, and then the dorsum of the calf to the cow's pubis, if it's coming upside down.

[00:08:08.41] And then we talk about posture. So the posture is going to be the fetal extremities with relation to the fetal body. So typically, we think about extension or flexion. Are the limbs extended or flexed? Is the head retained? Retained is also a common word that we use for these.

[00:08:26.53] There's two positions that are considered a normal delivery, cranial longitudinal dorsosacral, with the head and forelimbs extended, or caudal longitudinal dorsosacral, with the back limbs extended. Most calves are going to come cranial, but not all. Caudal can be completely normal. A certain percentage of them will come caudally normally. As long as the legs up, everything's going to go just fine.

[00:08:56.67] When we're talking about correction of that dystocia, there's some terms that we use a lot. Mutation just is referring to returning the fetus to a normal orientation for it to come out. Forced extraction, manual assisted removal of the calf through traction. Retropulsion or repulsion is when we're going to have to push that fetus back into the uterus and out of the pelvis because it's too tight, to allow for correction and movement of the neonate.

[00:09:29.40] Rotation, we're going to rotate that fetus along its long axis, if it's coming upside down. Version would be turning the fetus on its transverse axis. And extension of the extremities, obviously, is to correct any extremity that is back or retained into a normal orientation.

[00:09:49.61] For me, there's some rules that I deal with dealing with the dystocia. One-- my picture shifted. I apologize. Never give up a handle. If you have the head, the limbs, whatever you have, put a handle-- that's your handles for that fetus. Put those on a chain, a hedge there, have control of those. Even if you're going to retropulse them back into the body, you want to be able to have access to them, you don't want to push them away from you.

[00:10:18.65] Like I was saying, if you make no progress with 30 minutes of work, it's time to get a new plan. Always clean the vulva. even if that fetus has been deceased for a while and it's not the cleanest situation in there, don't ever take extra bacteria or debris in with you. Always clean her up. And get that tail out of the way.

[00:10:41.57] Proper equipment and technique is going to be very, very important when trying to do these. And then always finish what you start. If you start in with a dystocia, make sure you finish it, don't refer it in somewhere else for somebody else to do with a half a fetotomy or something like. That finish what you start. And just be safe while you're working.

[00:11:04.50] This is actually a picture of the OB sheet we have here at the school, with some of the residents and students working on a dystocia. We're actually able to tie her-- this animal's head off with a halter. There's a panel in front of her that's concreted in the ground. We can securely tie her off and make sure that she's there. As well as the side panels of this will actually remove out.

[00:11:27.29] You can see there's a handle about halfway down on there. And we can lift those up, open those up if she was to go down in the chute, open the head catch, and still have complete access to her with-- and being in a safe area without letting her go.

[00:11:45.12] Be sure that you always have the proper equipment that you need when working, obviously, OB sleeves, OB lube. There's a product called J-Lube that's on the market. We didn't-- J-Lube is great for palpating cows. You can miss a powder, you get it. You can mix it in a bottle with some water. It goes a long way. It is very caustic, at least, in the abdomen.

[00:12:05.43] So when we're dealing with dystocias, we recommend not using this product. Because if you're unable to perform a vaginal delivery and you need to do a C-section, this in the abdomen would cause severe peritonitis. So we avoid this product for those reasons. Making sure that you have, at least, probably, two-- I prefer to have about four OB chains present, two big handles a heads there, hooks, and a distortion rod are all things that come in very, very handy when dealing with a dystocia.

[00:12:43.99] Proper restraint on that initial exam is going to be extremely important. Having a tail tie, knowing how to do a tail tie, knowing where to tie it. Please, when you tie your tail ties, don't tie them to the chute, and let the cow out with tail still attached. Be sure to tie them to the

cow so that if you back her out for some reason or she goes down, it doesn't pull her-- the end of her tail off.

[00:13:10.21] Always clean the peritoneum. Plus or minus an epidural once you get started. And to determine the condition of the dam, the viability and position of this calf, and your ability to deliver this vaginally or not. I am not one who always gives an epidural, but sometimes, I do.

[00:13:33.25] Things that can really help you deliver a calf is tocolytic. Remember, one of the ones we think about all the time is clenbuterol. And remember, this is banned in food animal. If you know somebody from Europe, somewhere over there, they use a lot of clenbuterol, I believe. And they say it works really well as a tocolytic get lots of extra room, provide a uterine relaxation for manipulation of the fetus for removal.

[00:14:04.67] However, it is not allowed here. It is on our no go list with [INAUDIBLE] And so we stick with epinephrine. You can give epinephrine IV or intramuscular. If I'm working by myself, I would always just give it IM. It would be to the uterus by the time I got the animal prepped, scrubbed, and ready to go. If I was doing a C-section, I would give it IM prior to starting for a vaginal delivery. By the time I got her cleaned up and everything, usually, it kicks in.

[00:14:36.07] Being that I work in academia now and I usually have lots of hands standing around me, I usually let the students give it IV. It's about 5 to 10 mls on average based on the cow's size. And it works really well. Gives you about two inches of room in there. Or if you're performing a C-section, it really will relax that uterus for you to be able to pull it out.

[00:14:58.30] I do use it as well in goats anywhere from about a 1/4 CC to 1 CC, depending on the size of the goat. Some of those pygmies, I just give a tiny little bit. Inset prior to starting, just like always, getting ahead of the pain is going to be beneficial. An epidural, if I made it.

[00:15:18.41] And the reason I say, if I need it, I really love for them, once I get everything positioned appropriately, to fully push as a whole. I'm not a very big person. I'm not very tall. I'm not super strong. And so when I go to pull that calf, I want her to have a full contraction with me and help to assist in extraction of that fetus. So that's why I don't always give one, unless I really need to do a lot of manipulation and she's really pushing.

[00:15:51.18] Proper time placement. Any time you put the chains on, you want to do a half hitch above and below the fetlock. If you don't place chains appropriately, you can break a leg. So that is very important to remember. I put a couple of different ones in here that we deal with on a regular basis. It is pretty common, sometimes, to have a head retained. If you have four limbs, we want to go ahead and get chains on those.

[00:16:19.42] And then start thinking about handle options to be able to move this head. You can stick your fingers just inside the eye sockets or in the nose, to help assist to pull that head around. I don't really ever think about not putting my fingers in the eye sockets, even in a live calf.

[00:16:42.23] I can treat a corneal ulcer, if that happens to occur. Typically, it doesn't. But if it does, I can treat that. If the calf passes away while I'm in there, I can't do anything about that. So it's more important, sometimes, to get the calf out than other things.

[00:16:59.03] Never put a chain on the bottom jaw. If you pull in the wrong direction too hard one way or the other, you can break and fracture that jaw, and then have bone exposed inside of there.

[00:17:11.35] Hedge cinch work really, really well. You can feed it through the mouth. The other thing is I really like an OB chain. And I like to wrap it around the mouth-- behind the ears and into the mouth. I think it works better than having that head snare or the head snap thing on there. But just behind the ears and cinch into the mouth. And you can manipulate and pull that head around pretty easy.

[00:17:36.93] A lot of times, you do have to retro coax the calf back into the uterus. One thing I

did fail to mention is lube, lube, lube, and some more lube. Always have a pump and a bucket, a-- save all the things you need there. I typically dilute my regular lube about with 50% warm water to keep up room.

[00:18:05.18] Another trick that one of my mentors taught me was to have two buckets. One that is sitting off to the side, so you can just lean one way or the other, just out of reach of the cow to kick it. And then one behind you.

[00:18:17.96] So one is close by, and it has your lube and everything else in it. And then one is behind you, out of the way. So that if you need to put your tools somewhere, you drop them in the empty bucket behind you, so you don't have to go digging for them when you're working by yourself. And just trying to keep up with everything. Because it seems like these things are sometimes in the back, fully in the dark.

[00:18:41.45] When we're dealing with a retained forelimb, it's very important to, if you have one limb or a head, to, once again, get your handles on those. And then you want to reach down and get that foot in your hand. Any time you're moving a limb, you want to have control of the foot the best you can. Even though there's eponychium on there, if it scrapes across the uterus or the vaginal cavity, it can cause a tear. So you want to cut that in your hand.

[00:19:09.94] And basically, while you're pulling the foot medially under the fetus to you, can push the corpus away and laterally. And it just folds back to you pretty well without causing a lot of pain or discomfort for the calf.

[00:19:25.77] I have really short arms. A lot of times, I will place a chain around whatever limb I'm working with, higher up, closer to the elbow or the hock, and lift up so that I can get that foot in my hand and then push it away, and then adjust my chain where it needs to be.

[00:19:42.35] Breech, this is one that we think about pretty often. And remember, they can come cordially normally. And-- but when we're dealing with the breech, it's the caudal longitudinal dorsosacral with coxofemoral flexion or retained rear legs. And basically, all you get is a high knee. You've got the tail coming out at you, and that's it.

[00:20:04.61] So correcting this can be a little bit difficult. You need to retropulse the calf back in, and grasps that foot, have that foot in your hand the best you can. And then pull that foot, caudal back to you immediately while pushing the hock forward, back in, and away from you laterally. And it'll pop, that limb, right up to you.

[00:20:31.61] Once again, I have short arm. Sometimes, I have to put a chain around the hock, pull the limb back to me till I can get it in my hand. Sometimes, it works really well. It goes very easy. Sometimes, it's a little tougher to get the first one.

[00:20:46.70] Do remember, if the calf is alive, you're working on a time clock when they're coming caudally. Because once you get them into the birth canal and get the hips engaged, that umbilicus is then going to be clamped by the-- at the brim of the pelvis. And so you're really working on the time clock to get that calf out at that point.

[00:21:08.27] You don't want it to suffocate while in there once that umbilicus is clamped off. So you're really much more of a time crunch when they're coming caudally. So once again, you want to have somebody to be there and keep it up with your time.

[00:21:25.70] I personally never answer the questions because the owners are going to ask you almost immediately, is the calf alive? I don't answer that question. There are times when you can arrive, and she could have been in labor for a while. And it might be alive when you start, but it might not be when you get it out. So it's not something that I try to answer on the farm.

[00:21:49.69] Ways to tell if a stress cap is still alive, you can pull on the tongue. Sounds bad, but poke it in the eye, see if you have a corneal response. And if it's coming caudally, see if there's anal time. If those things are not there, there's a good chance it's already passed.

[00:22:10.09] After we get the calf out, we want to do a good reproductive exam. We call this

checking for tears and spares. Make sure there's not a twin in there and that she doesn't have any tears. Obviously, what happens if she does have a tear? If it's full thickness and you can reach your hand into the abdominal cavity, you really need to euthanize her. That contamination is going to be in the abdomen. She's going to get raging peritonitis.

[00:22:36.28] If she's very, very valuable, you can try to treat her with antibiotics supportive care and things like that. But it is very unlikely that she wouldn't get peritonitis. You need to warn the owner and give a guarded to great prognosis for that.

[00:22:53.38] If it's partial thickness, it will heal typically just fine by second intention. Depending on where it is, it could possibly form some type of adhesion. But typically, if as long as it's within the uterus or the vaginal cavity, you're pretty much OK.

[00:23:14.01] What to do if you can't deliver the calf vaginally? Well, then we're stuck with a couple of options, a C-section, a fetotomy, or euthanasia. A C-section is always going to be traumatic. Surgery is always traumatic. A fetotomy, in many ways, is better, because we're not having to open the abdomen. We're delivering that calf vaginally, just in multiple pieces, at that point. Obviously, a fetotomy is only an option if the calf is deceased already. So that is something you need to evaluate and know.

[00:23:49.05] And then of course, euthanasia. Unfortunately, this is a production animal. And there are questions that have to be answered about that. And so if a C-section or fetotomy is not an option, then you need to discuss euthanasia for the benefit of the animal.

[00:24:07.99] When we're doing a C-section, we need to think about location and where we're going to put them for this procedure. I always like to think, is the dam alive? Can she stand through the surgery? Because if she's really, really weak, and really dehydrated on this, or been in labor for a long time, just lay her down.

[00:24:31.68] She's going to lay down on me during surgery. She's going to need a lot of supportive care. It's a good time if you have multiple hands to potentially run some fluids or get some other things on board. But don't expect her to stand if she's super weak.

[00:24:47.04] Is the calf alive or is it dead? Is it emphysematous? Is there a abnormality for this calf? Those are all things to consider.

[00:24:57.75] A standing plank is probably the most routine way that we do C-sections. Then we can do a recumbent plank or a ventral midline. When we are doing these, regardless of how we do them, the important thing is to remember to completely exteriorize that uterus, if at all possible.

[00:25:19.48] This is an image I brought from Vet Clinics of North America from a C-section perform there. And what you're seeing is this is the fetal limb coming through the incision. That makes a great aid for getting this out.

[00:25:33.00] You want to-- or reach in there and find the foot, and either the hock or the elbow. And pull that out through the incision and lock it. Usually, it's the hock because most of them come cranially. Lock that in the incision, whether it's ventral midline or a flank.

[00:25:51.72] This allows you to make a good long incision from the toes down to the half or the elbow. Usually, as long as you make an incision that long, that incision will be large enough to get the calf out. You don't want this to tear while you're doing it. If it looks like it's going to start to tear, pause on getting that fetus out and lengthen your incision with your scalpel blade so that we don't have a tear in this.

[00:26:16.77] And by exteriorizing the uterus out, we're going to decrease contamination into the abdomen, which is greatly going to decrease our risk of peritonitis in these animals. But this is what we think of when we're doing these.

[00:26:32.30] The benefit of a standing flank, it's a very easy closure. You're going through the skin and muscle only, it is much easier on the surgeon. You can stand through this procedure.

It's not as hard on your back.

[00:26:46.91] Disadvantages, there's less exposure. And so it's less visually appealing if the animal is going to go to sale, we're going to have to shave the side where it can be seen. You're going to be able to see the suture line. There could potentially be some scarring or change in color of hair, which could be seen at the sale. And so that is a little less visually appealing. But it's much easier only to be able to do this.

[00:27:16.82] If you look into some of the different approaches to doing this, sometimes, it talks about gritting through the different muscle layers. I highly don't recommend this. The muscle layers run in different directions, as we know.

[00:27:29.90] And if you make your skin incision, certainly, and then you run with the muscle bellies one way, it's going to make it slightly smaller. And then run with the muscle bellies another way makes it slightly smaller. And then by the time you get to the transverses, you've decreased your incisions by a lot.

[00:27:49.22] I prefer to just go through one muscle belly at a time. I'll make a little window at the top of my incision, use either my fingers or my thumb forceps as a guide, separate between the fascial planes, and cut smoothly through each muscle belly. You don't want to halfway cut through muscle bellies, it makes things look very rough and hard to determine what muscles are to put them back together. So we want to make sure we have a good clean cut to aid in proper healing.

[00:28:21.65] A recumbent plank, once again, it's a lot of the same advantages and things like that, and disadvantages of dealing with a standing flank. The closure is easy. It is a little bit easier on the surgeon, not a whole lot, but you're not-- you're a little more upright than some of the others.

[00:28:43.34] Obviously, this isn't the most typical approach. This animal started standing and laid down. And so our incision was very perennally in the paralumbar fossa. And we had to close some of it, hold it together with tower clamps, and extend it down.

[00:29:02.30] We are not actually sitting on her chest. We're just straddling her to get to both sides of it. The disadvantage is, obviously, we're getting much lower down towards the abdomen. And so the milk veins are going to be something we have to watch and avoid for.

[00:29:20.27] I did forget to mention and I do apologize, all of this is done through local blocks. You can give a sedative. Most of the time, unless the animal is really agitated, I don't. I do local blocks, cast the animal down, if I need to give a large volume epidural, if I want her to lose control of her back limbs position or with ropes. But it is very simple procedure to do local blocks and do surgery in large animals.

[00:29:48.19] When we're doing a ventral midline, the thing about this is there is great exposure. It is great for fetal monitors, like what you see here. This one was delivered by ventral midline. Due to the excessive size and abnormalities, the limbs wouldn't flex. You couldn't get a hold of this thing. It would not fit.

[00:30:09.25] And many people think it's more visually appealing because you can't see the surgery side and scar, it's under the belly. So that is much better. The disadvantages are you're basically squatting or kneeling through the entire thing. It's harder on your back. You can bend over. It's much harder on your back.

[00:30:27.98] It's a more complicated closure because you're going through the linea alba, and then also around the umbilicus. Do not cut through the umbilicus, it is a very rigid and hard structure. And so we detour around it one way or the other, so that that's not a weak spot in your incision line. You're going to have to go almost from the diaphragm all the way back to the udder. So in dairy animals, that's the large udder, you're not going to have as much space.

[00:31:00.31] I will tell you, some of you ladies, one of the tricks that I do, when the animal isn't

perfectly up on its dorsum, it's slightly rotated towards you. And sometimes, you have to use like momentum. And so I will actually rock that uterus a little-- I'll rock it away and rock it towards me, and rock it away and rock it towards me, until I get some momentum and I can get that leg to come up and out and over the side.

[00:31:27.12] And then the best thing about this is it is so excellent exposure. And if you have an emphysematous status, everything is just going to dump right at your feet instead of into her abdomen. It's the least contamination. And so if the fetus is dead or just has a lot of meconium staining, things like that, it is really a good option.

[00:31:51.13] Things to remember when you are closing a ventral midline, you either want to do cruciate or what's called a vest over pants. The vest over pants is not a pattern that you're going to hear about much anymore. It's actually going to be discouraged in many ways. It's not an acquisitional closure. You slide one side over the other.

[00:32:14.57] Cattle are really, really good at making adhesions. And so that's what will happen as you slide one over, it will make a huge adhesion there and help hold itself down. The biggest thing is to make sure that your closure is secure, as secure as you can possibly make it. Because if it fails, in some way, and you can have a catastrophic failure.

[00:32:39.78] And a small hernia may not be a problem, but a large hernia is going to have big problems with that heavy ruminant up there. So you want to be very secure. Ruminants are very, very good at making seromas and things like that. So be aware as you close as well.

[00:32:57.64] When you're closing the uterus, you're going to use an inverting pattern. The one that's talked about the most is a Utrecht pattern, which is what you see here in these images. And it's basically what we call a baseball stitch. You want to start above and end below your actual incision. It is not a full thickness bite.

[00:33:20.59] You want to get to the muscular-- the myometrium, to the muscle layer, but not go all the way into the lumen of the uterus. And then it's at a 45 degree downward angle, alternating sides. And you want to be probably about a centimeter and a half to two centimeters from your incision line, so that it rolls it in.

[00:33:42.89] You can oversow the uterus, if you think it needs to be. Typically, I recommend changing suture patterns to a limber or something, another type of inverting pattern when we're closing these, just for secure sake. I think I probably oversown about five in my lifetime. And all of those were a compromised uterus where the animal had been in labor too long.

[00:34:08.51] We closed the skin most commonly in a forward interlocking pattern. It's a very secure pattern. I do usually at the ventral aspect on the skin, the most dependent area. I usually stop about three centimeters from the end of my incision with that forward interlocking, and put in a couple of either simple interrupted or cruciates.

[00:34:35.28] And the reason is cattle love to make seromas. And so if she does make a seroma between these layers, I can remove those last couple of sutures to allow that to drain, without having to undo my entire suture line, and allow for compromising of that suture line after doing that.

[00:34:57.54] Also, when you're closing on the flank, the two flank options, as I close, I usually close in two to three layers in the peritoneum, and the transverses, and then the external and the internal together, typically. I always, as I get from layer to layer, take a bite-- grabbing a bite of the lower below layer, about every second to third through to decrease dead space, to try to prevent seroma in these animals.

[00:35:29.04] A good clean C-section, where the animal is doing well, a lot of times, they won't make a seroma, but if she's been in questionable health, a lot of times, they will. There's no guarantees either way. But anything we can do to decrease dead space to help her out is going to be really beneficial for her.

[00:35:50.63] The other option is doing-- if you can't deliver it vaginally, is to do a fetotomy. I did throw-- I don't think many people see this very often. This is a Linde's embryotomy knife. And it goes on your finger. Not many people see those.

[00:36:08.45] A fetotome is going to be the number one thing. OB wire, not gigli wire. So for those of you who are doing mixed animal, remember, don't ever put gigli wire in your fetotome. Gigli wire is made to cut the bone. So it's like mini barbed wire, it's not made to cut through anything else. Whereas OB wire is made to cut through everything.

[00:36:29.34] So it's not going to grab and pull, and bring pieces of flesh with you, and gunk up your fetotome, get that wire hot, and not be able to do it, get things through. But OB wire handles, there's the wire drop guide, this Linde's embryotomy knife, and a Krey hook. The Krey hook and the A hooks can look very similar, so make sure you're not using those interchangeably.

[00:36:58.22] The cuts that we most commonly use-- this is a fetotomy being performed here in our hospital. This animal is in that same sheet I've showed you all earlier. And we were able to move the sides away from her, and open the head catch, but she's still tied off.

[00:37:13.97] This was a very small hit for pretty much a teenage pregnancy with a fetotomy that had to occur to get it out. The number one cut that typically happens is a decapitation. If the calf is coming out like Iron Man, heads out, can't retro-pulse it back into the abdomen, a lot of times, you have to take the head off when it's passed away, to get this out.

[00:37:38.84] You can either do that with the scalpel blade or if it's within the birth canal. You can actually use the fetotome to do that. And that will allow you extra space, lets the pressure off so that you can put this back into the abdomen, retro-pulse it back in.

[00:38:06.39] There's different ways to amputate the forelimb, to allow for extraction of the fetus. The widest part is actually going to be at the shoulder blades for this fetus. And so you may actually need to remove one to narrow things up to get it out. The scary thing is that if the shoulders won't fit, probably, the hips aren't going to fit. So be prepared to do numerous cuts if you think that's the case.

[00:38:35.11] You can either remove this percutaneously or subcutaneously. Either one takes a little bit of time. If you're going to remove it, you want to place the chain around the limb so you have control of it. And put a little tension on it as you go to control it so you can get things in there when you're removing it percutaneously with the fetotome, you're going to put a loop around the shoulder, and feed the fetotome in.

[00:39:10.75] Remember when you're using a fetotome that wherever the end of that fetotome is, that is where your cut ends. Wherever the front of your loop is is where your cut starts. And so when you place this, remember to have it far back past the scapula. Because if you don't and it slides up, you're going to go through the scapula. So you want to make sure that that fetotome is placed well far back past the end of the scapula because that's where the cut will end.

[00:39:38.80] If-- and you do need two people. And you need to be the one always holding the fetotome in place so that if it slips, you know where your cut starts, you know where your cut ends. You can get someone on the farm to do the heavy work of sawing back and forth while you're doing this. But please stay in control of the fetotome.

[00:39:59.81] When we're doing the removal of the limb, otherwise, you will need the calf jack. And we put a loop on the foot, and you're going to make a circumferential cut all the way down around the limb.

[00:40:16.91] And unfortunately, there's not a good way to show pictures of this, because it all occurs inside the cow. But then you're going to take that Linde's embryotomy knife, and make a cut from all the way back by the scapula down the limb to the circumferential cut you make distal on the foot.

[00:40:33.84] And then you're going to remove all the fascia, all the subcutaneous tissue that's holding that skin on. And basically, dissect it out within the cow. And then once you've broken all that fascia down, you can use the calf jack and pull it off, because the only thing holding on their forelimbs is muscle.

[00:40:54.04] And then if you have to continue and cut [INAUDIBLE] deeper truncation, then you want to make sure that you have a loop going all the way around the whole body over the abdomen. You want to take all the ribs. You don't want to have rib bones sticking out while you're trying to remove it. That's dangerous for you and for her. But it's just a cut all the way through, transversely through the abdomen.

[00:41:19.66] Division of the pelvis can be one of the most complicated ones. If it's a breech, coming backwards, or if it's too big to come out, that's one way. Or if you're having to completely divide it out, getting to the pelvis, if it was coming cranially, and you've made these other cuts.

[00:41:37.43] The important thing to remember when you're doing those is whatever leg you're putting your loop around, make sure that the fetotome is on the tail head on the opposite side. If it's not on the opposite side, you're just going to take the limb off on one side.

[00:41:55.37] You want to cut diagonally through that pelvis to decrease the diameter as it engages the pelvis of the dam. And so you're going to take the right limb off. Make sure your fetotome is to the left of the tail head. If your going to take the left one, put the fetotome head on the right side of the tail head to make sure you're cutting diagonally through there.

[00:42:18.71] When we think about the post-partum care of the dam, she's probably going to need a couple of doses of BANAMINE, regardless of the way you get this out, antibiotics, when necessary. I don't give every dystocia antibiotics. If the fetus is deceased, if it's really nasty, if I do a fetotomy, those are all things that I probably would.

[00:42:45.30] But I do encourage you to have good husbandry when it comes to antibiotics and deciding which ones are needed. I personally have a preference for either oxytetracycline or metfor when dealing with these. I feel like I've had good success with them. We know they have good penetration to the uterus. And those have been very effective in my hands when needing to do this.

[00:43:12.03] Oxytocin, if she needs it, is another thing. If there's a live calf, you have a walking model of oxytocin, so it's not necessary. If you don't, a dose or two wouldn't hurt. Remember, it has a very short half life. So you would have to give that pretty frequently, which can be ineffective for many producers. But at least, at the time, you've given her a dose.

[00:43:35.52] When we're talking about that calf, if it's born alive, remember to check for birth defects. Check the anus, cleft palate, heart defects, eyes, limbs. Make sure everything is there before you get going. And then make sure that that calf is able to nurse or you administer colostrum.

[00:43:55.83] Remember that hypoxic and stress calves, they don't absorb colostrum well. So it's a good idea, once the calf is 24 hours old, to check PCV and total solids. When you check that total solids on your refractometer, remember that about 5.8 is what you're looking for on an individual calf basis to know that they've had good passive transfer of antibodies to the colostrum. If it's not at about 5.8, if it's less than that, we probably have some level of failure of passive transfer, whether they didn't get enough, they didn't absorb it well, or it's poor quality.

[00:44:35.50] Those are all things that we worry about and think of when we're dealing with these. I typically recommend sutures to come out if you do a C-section, obviously, at about 14 days. And just keeping an eye on these animals just for a little bit. If they haul in to you, I highly recommend that they do not jump back on the trailer and go home, unless it is just a moderately assisted vaginal delivery.

[00:45:03.85] Those animals are very stressed, they've been through a lot, and it doesn't set

them up for success in the post-op care to jump back on a trailer and go. Animals that have been in labor for very long, once you relieve that, are typically pretty hungry and thirsty. So remembering to provide that.

[00:45:24.22] If the cat's tongue is swollen, I recommend going ahead and tubing it, and getting colostrum in it. It's not going to nurse well and that kind of thing. It's just not going to do well at all. And there's a much higher rate of failure of passive transfer in those calves.

[00:45:44.11] One thing I did forget to mention when you're treating retained placentas in cows, remember not to pull those out. Let her pass them on their own. A couple doses of oxytocin after about five days, you can get prostaglandin. Typically, they passed by then.

[00:45:59.38] My preferred method is just, for lack of a better way to put it, but not neglect, tie them up, so she's not stepping on them and pulling them out. That puts a little weight on them, and provides for mother nature to do their part to remove those.

[00:46:16.12] Typically, cows do not get super sick from having a retained placenta. She's going to have some metritis, delayed uterine involution, those kind of things. But it's typically not a problem. But those are things that you need to just watch and be aware of.

[00:46:35.20] And with that, I'll take any questions you have. I hope I didn't talk too fast.

[00:46:42.14] That was great. Thank you so much. We'll give it just a few minutes to see if we do have any questions. It was a nice reminder. I feel like I did quite a few of those in school, and haven't touched them since. So [LAUGHS] it's good to review, for sure. And I always forget that routine is such a big deal in cows, because I'm so used to equine side. And it gives you an immediate heart attack when that happens [LAUGHS] in equine.

[00:47:09.47] So-- but if anybody does have any questions, feel free to type those in the Q&A. We can answer those. I know this is a nice review. We hope to do a lot more. If you guys could, when you take your polls later, go ahead and give us some ideas for other [INAUDIBLE] related topics you want to hear.

[00:47:28.34] Jessie doesn't just do cattle, she actually enjoys canine repro as well. She's got-- a [INAUDIBLE] dog, is that right? [LAUGHS] So we could definitely do some small animal topics as well. So let us know what you'd like to hear. We definitely want to start doing more of these over time.

[00:47:47.27] All right. Looks like we do have a question. In dairy cows and dystocia, how often do you find that milk fever is associated with the dystocia?

[00:47:56.31] I find that it's pretty often that they have a dystocia. And typically, the ones that do have a dystocia and have hypocalcemia are also going to follow that with a prolapsed uterus. That just goes hand in hand. I don't know that I've ever seen a dairy cow that had a prolapsed uterus that wasn't hypocalcemic.

[00:48:16.99] So it's definitely a big problem for them. They get weak. They're unable to have good uterine contractions and things like that. So don't be surprised if you get called out even where the farmer corrected the dystocia, he was able to pull the calf, and then the uterus just followed it right out. That's very, very common. And you just have to put the uterus back in and treat the hypocalcemia.

[00:48:45.17] But I would say, with dairy cattle, greater than not, it's going to be due to a dystocia. I do have to tell you, I practice in the Southeast where dairies are not as big of a deal anymore, there's not as many of them. But the ones I've seen, more than likely, there's a metabolic reason behind it, especially with dairy cattle. Thanks.

[00:49:10.40] Do you find that they are also more likely to go down on you because of that?

[00:49:17.04] Yes. Unless it's just like a really big calf, which I don't feel like I see as much in dairy as I do in beef. Unless it's just something like that or fetal monster, where there's not a level of hypocalcemia, it's just a fetal-maternal mismatch. They do seem to lay down a whole lot

more. And that might just be the ones that I get because it's so hot and humid here in the Southeast, for sure--

[00:49:44.97] Yes. They're also fighting that.

[00:49:46.65] --versus other parts of the country. But it does seem like they want to lay down a little bit more. Dam and beef cows that are first year heifers, they like to lay down a lot.

[00:49:57.72] Yeah. Nowhere down here is great for any cattle, I don't think, but--

[00:50:00.36] [LAUGHS] We should have--

[00:50:00.72] --got them around anyway. I miss the dairy cows, though. That was one of the more fun-- I don't know. I just-- I enjoyed them. We do you have another question. Which breed of dairy cows are most prone to dystocia, in your opinion? I feel like that's probably going to be loaded too, because we only see a couple of breeds down here. [LAUGHS]

[00:50:20.44] So most of what I see is Holsteins. But that is also where I'm located. I don't have a lot of Jersey clients or Brown Swiss or Ayrshires. That's just where we're at. It's mostly hosting around me. So I feel like my response is going to be a little jagged towards that.

[00:50:46.41] I really feel like it's just going to depend on the breeds that are around you. And you're going to feel like you see it more in that, but that's also just the breeds you see the most of.

[00:50:54.91] Yeah.

[00:50:55.32] But I think it's definitely Holstein.

[00:50:57.75] That's like being in Georgia and asking what dog breed is most associated with dystocia. [LAUGHS] It's obviously going to be a bulldog.

[00:51:03.69] Exactly.

[00:51:04.11] [LAUGHS] Well, great. This has been a lot of fun. Thank you so much for joining us. I hope everybody enjoyed the lecture. And hopefully, we'll have Jessie back soon for another talk Thank you so much, everyone. Have a good night. Bye.

[00:51:18.48] Bye.