## Benefits of Early Pregnancy Detection

## Season 1, Episode 23

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**Olivia Amundson:** Welcome back to another episode of cattle HQ. Today I am here with Dr. Halden Clark out of the Great Plains Vet Education Center in Clay Center, Nebraska. Today we're going to talk a little bit about the importance of early pregnancy, detection, and the influence it can have on your operation. I'm also joined today with my colleague Kiernan Brandt. But to start off this podcast, Halden, how about we just have you just give us a little introduction about yourself and a little bit about what your day-to-day looks like.

**Dr. Halden Clark:** Yeah, thanks, Olivia. I work at, as you said, at the Great Plains Veterinary Educational Center, and the main focus of my time is spent with veterinary students that are in their fourth year of vet school, and it's my time is spent in trying to help them develop all of the hands on skills that they will need to go on toward a career working with cattle. So we work on things like calving, manual palpation, ultrasound, pregnancy detection. Then all the day-to-day, normal tasks related to sick animal care, taking care of the beef animal’s feet all the things that are needed in day-to-day veterinary practice. So never quite know what most things are going to look like until the end. But it's ah it's good. We enjoy it here, and we have students this week, and hopefully they're getting what they are wanting, and they're getting to work on a lot of different cattle. So that's a little bit about what we do down here,

**Olivia Amundson:** So I have just some, a fun note about you that you make your students do kettlebell workouts. Is that true?

**Dr. Halden Clark:** Ah, no, not make it’s always options but yes, that is one part of what we do down here. Actually so I don't know if you know what a Kettlebell is, it's basically a cannonball with a handle and a lot of the exercises that are done with those are swinging type movements that it's I what I like to say is, It's basically like loading a whole bunch of small square bales, but without all the itch and dust. They tend to be similar in weight to most small square bells in a somewhere in the neighborhood of thirty, five to seventy pounds. They go down to fifteen pounds or so, they are basically a way to develop good biomechanics and get a good workout in a short amount of time. The benefit of them, and the reason we use them with students is they really seem to be helpful in keeping low back healthy as well as knees and shoulders. We want our students to thrive in large animal practice for many years, and we just feel that that's a tool that can help lay a good foundation of physical strength and coordination, to be able to stand up to all the rigors of working with cattle which are not unique to veterinarians, cattle producers as well place a lot of heavy workload on their bodies, and it's important to take care of all the tools available to us, one of those being our own physical health. So yeah, I've always made it optional. But I really have had very few students that didn't want to be involved in. So hopefully that's something that they can learn down here. It takes a fair bit of practice and it you need some coaching to get started. Well, ah, at least for a week or two. And so, yeah, that's one thing that we're hoping that bring some value to the students that come through here.

**Olivia Amundson:** I really appreciate that and Kiernan even knows I'm sure I could spend plenty of time asking you about what Kettle bell exercises you're actually doing, because I myself really enjoy exercising and running and. But no, I thought that was a really cool, just fun note about what you do with your students, and so I wanted to bring it up. But I do think it there's obviously added benefit to that and if it's something that you know your future vet students can kind of make a habit to maintain that physical health that they can like you said endure a lot of that rigorous activity that they do as veterinarians. I think it's just going to be beneficial for them in the long run. Absolutely. I figured you were doing it to strengthen their arm for simply palpating reasons which I was going to use to kind of jump right into, our next question, or the next topic of talking about early pregnancy detection, and something that you know, I think, can be very beneficial for cattle producers and their operation as a whole. But I think to just start out. Why, don't we talk about trying to make it talk big picture here. You know what is early pregnancy detection, and how early is early?

**Dr. Halden Clark:** Yeah. So I'd say, there's really no hard and fast number but I would say that if we are under four months of gestation or one hundred and twenty days we're fairly early in that in that time of gestation. So, yeah, First trimester, or maybe even just a little bit beyond we're pretty early yet. A lot of beef cattle are pre-checked at six months gestation. So this would be four months, and under just a ballpark figure.

**Olivia Amundson:** So how can ultrasound be beneficial in early pregnancy detection? I know there are guys out there that I can palpate, you know, an early pregnancy all the way up to thirty, thirty-five days gestation. But I guess, in terms of using ultrasonography which they call the gold standard. Is that kind of your method of practice when you go out and preg-check these cattle, or do you mainly use palpation and check more of those six months cows or and I guess maybe even a better way to put this is, when can you use ultrasound? And when should you use palpation?

**Dr. Halden Clark:** Yeah, so that is a good and large question. So I'll explain some of the basics of what goes into some of the answer to that. So when we think of a cows pregnancy, and an approximately nine-month gestation by about thirty days of gestation the baby is inside an amnionic vesicle. So it's basically you can think of it as like a pea. It's basically a little water balloon the size of a pea, and it's inside the uterus in some other fluid inside there. So maybe about the size of a half a banana or so of fluid, and then there's a little pea floating inside there, so with an ultrasound, or by palpation, you can find that pregnant horn, and you can, and palpate that little baby in there, or see it with the ultrasound by about thirty days, pretty reliably. And then, as that fetus grows by, oh, let's see so by fifty days it's probably roughly the size of a grape, by sixty days the whole baby is about the size of a mouse, and then that's roughly two months, sixty days, being two months. So by three months it's about the size of a rat, and then by four months it's something like a kitten, maybe a kind of a big kitten by five months. It's about the size of a full row cat. By six months it's the size of a beagle dog. So as we teach vet students, we tell them, starting at two months, it's mouse, rat, kit, cat, dog, kit just being short for kitten. So mouse at sixty, rat at, sorry two months, mouse at two months, rat it three months, and so forth on, up to a beagle-sized dog at six months, so you can see from the if you think of a beagle dog how much weight and bone that calf has by six months gestation, and it has at that point up until about three months of gestation the whole baby inside the fluid-filled uterus is up in the cow's pelvis well within reach for most palpators or ultrasounders.

After that time, though the baby slips forward past what we call the brim of the pelvis, which is the front edge of the pelvic canal and a cattle into the abdomen and basically goes beyond the vets reach beyond the palpator’s reach, and beyond the reach of the ultrasound. Most ultrasound will penetrate through between eleven and twenty-two centimeters of tissue, which is actually not very far. It means that less than ten inches is basically the full reach of an ultrasound. And when you think of a cow's belly, that's not all that far, and that's the maximum most of the time its set to penetrate even less than that, so that you have good detail. So as you can see through a big part of the gestation the calf is in the cows abdomen and is basically out of reach for the palpator. I'll use that term synonymous with the ultrasound or the technicians that's doing the pregnancy detection. And so with ultrasound you can gather lots of information that you can't necessarily feel manually if you're palpating manually. For instance, you can tell if the uterine fluid is cloudy or not. If it's cloudy, that can be a sign that a pregnancy may be in the process of being aborted or lost, miscarried. If the baby has a heartbeat you can tell that it's doing well. You can't tell if fetus has a heartbeat you by manual palpation. You can more easily diagnose a pyometria, especially a good-sized pyometria which means pus in the uterus. With ultrasound, it's not a real common condition in beef cow, but it can't happen that tends to be a little more frequent in dairy. So you can gather quite a bit of information with ultrasound that's hard to get with palpation alone. And that is true basically until the baby goes into the abdomen and is out of reach of the ultrasound probe and at that point you really can gather more and better information by palpation as far as staging. So if you're trying to determine, is this a six-month pregnancy seven months eight month, if you need staging past about four or five months of gestation really by hand is better. But if you need speed, and you know about when the bulls went in, and when they came out, and you're not asking for staging. You just need speed. The ultrasound may still be the better option even at those later dates, and then, if we go back to the front end of gestation now thirty to sixty to ninety day timeframe, where you can get a lot of extra information with the ultrasound. If the question is accuracy, which one is more accurate, the answer is that it tends to be a little quicker to learn to be quite accurate with ultrasound versus palpation. But once a person learns to palpate well by hand, their accuracy is basically equal with an ultrasound, looking for both staging and pregnant open status. So we with the students we work within a few hundred, maybe several hundred reps with an ultrasound. They're getting fairly good, but it takes a several thousand reps by hand before you start feeling like you're really starting to catch on. So learning to palpate by hand is, is kind of an art form, and different practitioners will vary in which range of pregnancy they feel most comfortable in. If they've if they've not in their practice career, not been asked to do a lot of very early pregnancy, examination by hand. They may not feel particularly comfortable with it, and they may feel comfortable with an ultrasound.

So what I would say is as far as which to choose. I would say that for the most part depending on what information you're trying to gather, let your vet decide. Your vet will be able to guide you with regard to what he or she is more comfortable with, what he or she feels more accurate at and prefers. Some of it is simple preference. And then another factor again, in the early end of pregnancy is speed, then ultrasound tends to be a little quicker, once the technician is competent with it, it tends to allow for a fairly quick throughput. One other site benefit is, you can run an ultrasound with multiple screens. So if you have several people standing there doing different tasks, and they need to know, pregnant or open before they can do their task. You can run it to a TV screen on the wall, or you can run it to a screen that sits back by them and if they know how to read the screen on a lot of pregnancies they're going to know right away, too. They're going to see a calf ahead, ribs a heartbeat, all of it very plainly, too, and then that can help the group process cattle smoothly. So ultrasound is a powerful technology. I suppose the one other bit of information that you can gather with an ultrasound that you can't gather by hand is feel sexing between about sixty and seventy, five, or eighty days of gestation. Somebody that's skilled in fetal sexing can determine the um sex of a developing fetus with very, very good accuracy. Probably ninety, nine plus percent accuracy on bulls, and probably at least ninety-five, ninety-six, ninety-seven percent accurate on heifers. Now, if they catch the pregnancy in that range, so that's one other one other potential benefit of ultrasound. If that is information that you want to gather. So that was kind of a big answer, hopefully that is a little bit of info that can kind of clarify what's going on in there, and why some things work better in different circumstances.

**Kiernan Brandt:** Some of those new ultrasounds are so cool. The guy that was teaching me was watching behind me on his iPad while I had the goggles on. And yeah, I know exactly what you mean. I'm kinda in that progression right now myself, of just getting the repetitions under my belt, and especially those late termmers like once they fall off the pelvis, I did not really expect it to be such a drastically different muscle group in my arm, because I mean I read quite a few cows and feel confident and consistent. But you're just asked to go down a lot differently than you ever have been before, and I feel silly because I'm tired after six, and all I can find is uh, you know placentomes, and I can't even find a bone or a spine, and it's frustrating. But I've noticed that yeah, if you're they’re before one hundred days and are still sitting there it's remarkably easier.

**Olivia Amundson:** Yeah, that's why uh, that's why Kiernan volunteers e to pre-check cows a lot more often than himself. But Kiernan’s right there's a lot of really neat ultrasound out there, and you were just you made a really cool point how you can use multiple screens. And as you were saying that I was trying to figure out how I could make that work in our own operation to just make things fly. Not that I'm a very fast ultra-sounder, but I can do you know enough head at home to not have to call the vet. But if I could, you know, incorporate some of those extra screens obviously that gets pretty fancy, but it sure would be nice and deficient or more efficient. But kind of going back, so you gave us a lot of information there on ultrasound versus palpation. But I don't know if you actually give us an exact number on what is the lowest number post insemination that you could potentially preg-check an animal.

**Dr. Halden Clark:** Somewhere thirty or just a little over thirty-two is a number they get given quite often thirty-five, and again, that's going to be dependent on your vet. Some vets would be very comfortable in the thirty range with ultrasound, and prefer not to try to do those by hand, and other vets would be comfortable by hand. It just varies. So that's a that earliest potential stage is an important one to just discuss with your vet and see what uh, what he or she likes down that far. It takes practice to get down that far you can, the horns of the uterus are highly mobile at that stage, and for a couple of months after, and that you can find pregnancies in weird places. It can be easy to miss them if you, if you run into the same like, if you zip into the same spot every time you can, you can miss them. So you yeah those early ones, it can be a little ticklish, and that's not all. So I guess a part of this conversation, too, which I think we'll get to a little later but it's worth a mention here. When we do push down into those lowest possible post insemination, break check dates. We do put a little bit of risk on early embryonic loss. We increase our risk of early embryonic loss, meaning that the stress of the chute event, basically the animal having to be gathered, caught, potentially sorted, put through an ally and a chute and caught in the head catch, and then ultrasounded or palpated and released. Just that event alone, we're going to have a small amount of pregnancy attrition at those very early stages we're fairly confident in that. Similar to the way you would expect a small amount of pregnancy loss If you were going to put those cattle on a trailer and haul them. That stress just uh is going to be a there's going to be a little risk to those early pregnancies.

**Kiernan Brandt:** And I don't want to get really technical. But is that is that due to just that baby not being firmly attached, yet not really a whole lot of security. Or is that just a weird, susceptible, developmental stage?

**Dr. Halden Clark:** I don't know that we know exactly what causes the majority of those losses we know it's stress-related, and then it also may be physical and mechanical as well. Yeah, like you said not, they don't have the firmest attachment to the uterine lining at that point. That's possible. But then also the stress hormones that circulate at that time could play a pretty significant role too

**Kiernan Brandt:** Sure.

**Olivia Amundson:** something I've always been really curious about is when you're palpating that early, is it, are you going to see more embryonic loss with, palpating with your hand, or with the ultrasound? Or will you see less with ultrasound at that early?

**Dr. Halden Clark:** For a person who is a technician who is extremely skillful by hand. There's very little to no risk but for somebody that's learning, at those early stages there is some risk to the pregnancy from palpation. And actually the same is true with ultrasound. If somebody is in there very skillfully taking a quick look and getting out, there's very little risk. What I like to tell students, and I think this is roughly accurate that the baby at that stage is roughly the size and tissue integrity of a grape. So you don't want to, you don't want to rough it up. You don't want to cause any interview and bleeding. You don't want to um push your pull, or squeeze, or twist, or hurt it. So as you're learning, there's certainly more risk both ways. With not said, yeah, I think there's probably a slightly lower risk with the ultrasound, just because you're not necessarily retracting the uterus and need to run both horns. But skillful technicians do that very, very safely. At the same time.

**Olivia Amundson:** That’s good to know that's always just been a thought or a question I've always had. So, I was kind of doing a little bit of research here, and I found that only about twenty percent of actual beef operations in the United States use palpation or ultrasound for pregnancy diagnosis. Which to me means that only about twenty percent of you operations are preg-checking in general. So how do you see pregnancy detection being advantageous to a cow/calf producer in a normal year and in a dry year?

**Dr. Halden Clark:** Well, I think we could break this up into several parts. So for starters, when we look at those nationwide descriptors of our of our cattle industry, it is very interesting isn't it to see the great differences in management techniques that are used from coast to coast to this country, maybe more so from north to south to, there's some marked differences that way, too. So yeah, that's an interesting number and I've seen that, too, in the NAHMS data that twenty percent of herds do some form of pregnancy detection. But I think and correct me if I'm wrong, but only about is it half have a have a defined calving season, and so if the other half of the industry does not have a defined calving season it'd be pretty hard to know, when to gather them to preg-check.

**Olivia Amundson:** That's a very good point.

**Dr. Halden Clark:** Those herds are managed in ways that probably make a lot of sense based on the goals of that operator in that part of the world. So it'd be fun, we've talked about this here at work. It'd be very fun to have a Nebraska NAHMS. To have basically a really good set of descriptors of our Nebraska beef industry. I'm quite confident that the number of cows that get pre-checked in this state would be far, far higher, and I think for good reason. There's the classic time-honored reason to project a beef cow before winter is so that we don't spend a lot of money feeding a non-productive animal through the winter by feeding hay, anything else that's harvested, and therefore relatively high in cost. And there are, uh with that said that being the classic reason to preg-check in order to save the money that you would otherwise spend on non-productive cows through the winter. The other side of that coin is that if cows go out on corn stocks for the winter, and that's actually your lowest cost feet of the year. It actually does seem to take some of the drive to get cows preg-checked away, because that market in the fall, for cull cows can be sort of flooded in a normal year. The market for cull cows in the spring may look a little bit better if they've wintered well on the corn stocks, and they still look good. So uh we have both parts of that spectrum present right here in Nebraska, so it's. It varies a lot by herd and goals.

**Kiernan Brandt:** You know I think it's really interesting, I guess, under the philosophy that, yeah, okay, maybe we can limp this cow through the winter, and it's not really costing us a lot. And you know that's a topic for another day is how we can get the most money out of our cull cows. But um, you know, I think you're right there. Um, but I always, you know, and especially kind of with some of the stuff we've talked about already from a management perspective, I always and you know Olivia is a bigger advocate for a defined, consolidated calving season, even more so than I am. But the longer end of that, you know, like a good, sweet spot kind of around that ninety-day mark, because then you have the opportunity to catch those ones that are at least thirty days along those late stragglers, and they're easily identifiable as early, still, you know, late in the breeding season pregnancies. And then you're not wasting a ton of time fishing for fishing, for babies that are clear down in the bottom of the barrel, trying to figure out if they're going to come next week, which you know, me and Olivia have some personal experience with battling that giving shots during breeding season, and then having calves show up. And I think that's you know, that's just a really important note, especially with the theme of today's episode, or point out. Because yeah, I came from the south, and we always had the running joke that cattle producers were so considerate because they broke their calving season up into twelve nice, thirty-day intervals, and because it, you know, but I mean an entirely different production system. And uh, like all of those guys work in town, and its small numbers of calves whenever you just need to free up a little cash. I think time and time again when you start crunching the numbers and just looking at the nitty-gritty of it. It always kind of pays, regardless of what you're selecting for, to know which cows are getting bred on time and doing their job in a timely manner.

**Dr. Halden Clark:** And then, beyond that, too, there's certainly a value to the peace of mind that you have knowing that you had a good breeding season. I don't know how you put a number on it, but I know it matters if you like those bulls, and you like those cows, and you sure hope that they like each other but you don't know until you pre-check. So, I think that's there's a value there, and I think, evaluating your calving distribution as far as a barometer on the health of your herd and the quality of your management. If you have a pretty close to ideal calving distribution, and you can prove that with your preg-check data, that's a sign that you're firing on all cylinders, and that can be a really good shot in the arm. So some really good feedback. We like to say here that you cannot manage what you don't measure, and so the things that you're measuring. If you're measuring and learning about your calving distribution, and you're getting it tightened up. Then you're able to manage it, and you're able to make improvements, so I think those are some benefits to preg-checking in general that are hard to put a dollar figure on. But there is a dollar figure associated with them.

**Olivia Amundson:** Yeah, I agree, and that's something that um I know I am personally going to be experiencing this year. Typically, you know, the cows don't get preg-checked until close to weaning time so closer to November. And so a lot of the times you don't, you don't really have a great gauge on the gestational age of those calves you just know whether they're pregnant or open. But this year we're switching things up a little bit, and we're going to do an earlier preg-check, so that we can tell first AI, second AI, and then very first bull bred. But then, after that we're going to be able to kind of make a hard cull on those cows that, you know, have not been bred. And then hopefully, really start to define that calving season which I think it's going to be really fun to see um from just years past and where, like Kiernan and said, you know we've been in projects where we're giving those setup shots, and then she goes and lays down and has a calf, you know as we're preparing to breed cows. And so um, I do think that, having you know, doing some of these early pregnancy detections, or pregnancy checks can be really beneficial, and they don't always have to be like right at thirty days or sixty. But as long as we can get an idea of what we want our calvings distribution to look like, so that those girls that didn't meet that cut off we can kind of decide from there what we want to do with them, and that's you know, that's another one of my questions, I guess, is when we think about doing some of these earlier pre-checks, you know. Sometimes it happens when that calf is still at side. How do we manage that? If we have a cow that has a calf at side but then she comes up open. I you know it's something that I play around with, you know. As do we keep that cow and feed her. Can we get rid of that cow and hope that calf, maybe, you know, steals from some of the other cows? I don't know It's one of those questions, I guess even I have

**Dr. Halden Clark:** Yeah and then how do you capitalize on the value of that pair. Should they be sold as a pair, or should they be split? How old is the calf? Yeah, yeah, there's a lot to that for sure. And then we are confident that when a group of calves are early weaned, they can do very well in many circumstances as long as that's handled very carefully. And yet we typically do that as a group, and not as a few, although as long as you have at least a couple uh that we're old enough to be early weaned at least at least three four months old at a minimum, I'd say, and you can manage them and devote the labor to them that they're going to need. They're going to need some TLC at that young age. If you're if you're able to do that, I think that's a one strong option. But at the same time, if it's a single calf, it's it may not be the right thing to do. It might be better to just let them progress on to the normal weaning stage and then go from there. Yeah, I can be tough to know what to do with the open cow. And then it other things that make that decision potentially harder or easier, is that she also have a bad eye and a bad foot and a bad bag and the calf under-performing, compared to penmates, and all those kinds of things, too. So I one thing I used to, well, I still say I used to work for some good sized dairies in Colorado, and even if the dairy had four thousand cows, the culling decisions was a cow by count. Even on those big farms they looked at each individual cow. They looked at her milk production and her breeding history and her foot health, and how many times she'd been work on, whether it's a foot, or a mastitis case, or anything else, and they make those decisions one by one. And I think that's very true on a beef herd too, we have to take all factors into account when we are thinking about keeping your calling, and this year a lot of those decisions are being made as the grass gets thin. So yeah, it's a, it can be challenging, but certainly some it's a time to keep all the factors in mind out on the table.

**Kiernan Brandt**: I think that's one of the huge reasons that it's so important to start measuring some of these things is, I mean It's like these lowly, heritable traits, like fertility, taking those really close looks on an individual basis, and selecting specifically for those nitpicky details at points, is exactly how we start to make progress in some of those areas. You know, one of the huge major issues that prevents some of this is labor, is facilities. It's just tough to get guys there that time of year, especially where we're at on this side of the state. I mean, guys are harvesting and rolling right into other enterprises, and they're busy. So I guess you have any, what would you say to someone that has never done it before? Isn't really set up for it. But mean as we've kind of covered, everyone stands to benefit at least a little bit from knowing some of this stuff.

**Dr. Halden Clark**: Yeah, as far as labor, I used to work with groups that would basically team up, it might be for farmers in an area or three farmers in an area that would, we'd see one with all his calves one week and another one like basically, three guys with green calves, and they all belong to one guy the first week, another guy the second week and the third guy the third week. So I think teaming up to do some of those kinds of things makes perfect sense. I've had several cattle projects in different places, and it's always been with other people. Because and there's where I have a day job and they have day jobs. If cows get out and somebody needs to go, it's nice, if it's not just one person that's getting the phone call that there's at least two, maybe three options of somebody they can cut loose, and you'll get the cattle back yet. So I think I think teaming up good old-fashioned teamwork is one way to fight the labor problem, because it is such a seasonal thing. It'd be tough to hire outside labor to help with the cows if really you mainly need help with getting them caught and gathered and weaned and worked in the fall and preg-check. From a labor standpoint I'd say one thing that's been a big uh success in you know, especially smaller cattle, well all sizes of operations, but it has some real benefits for smaller operations, it is just a simple bud box. You can make a very simple bud box out of out of portable panels, and you can work significant numbers of cattle through there, and you can pick it all up and move it to another field, if you need to do it in a in a field here, and then in a field there, so as far as the difficulty of getting a facility. There are some pretty good answers these days to some very simple yet highly functional working facilities, mainly based on the idea of a bud box, and taking those cattle to the end of an alley, shutting a gate, spinning them around and letting it walk right into a ah, a single file working alley, and then just bringing the number in that'll fit right in that working alley single file, so there's not, they're not waiting, in the catch pen thinking about not liking this situation very much. So I'd say from that, for labor and for facilities are two things that I think are about as good as you can do for smaller operations.

**Olivia Amundson:** And so other than that other than like palpation and ultrasound. You know some guys may have, you know, a handful of five to ten cows, and it might not be so extremely cost-effective to have a vet come out and do this prey, check or palpation. Are there other methods that guys could potentially use, that wouldn't require them to have a vet bill to come out and do that for them.

**Dr. Halden Clark:** Ah, yeah, there are a few things that make sense for, especially when it's a handful of cows, and especially when it's cows that are like easily accessible, easy to catch and work with. Whether that's a, embryo recipients, or show cattle or things like that. There are blood tests for pregnancy. There's one called BioPryn that is, is readily available. If the producer knows how to draw blood, typically it's drawn from a tail vein. Once you learn it, it's pretty slick, no pun intended. It can be slick back there, but it's pretty easy to get that done, and to get a good blood sample, and then you ship that to a lab. So there's postage, and if you do large numbers, there's it can be a challenge to keep all the numbers straight. You have to have all your numbers straight. There can't be any doubts if you're going to write an ear tag number on a tube and send it in the mail, and they're going to transcribe that into their computer system. It's got to be legible. It's got to stay on there. You can't let it get, if it gets wet they can't run, so care needs to be taken to get that process to work well, but you can do that, and then you can send those samples to labs. There's labs in Lincoln, and there's labs that are in Greely, Colorado that will run those samples, and you'll get an answer back, and then you can go back and sort out the cows that need to go with the opens or the pregnants. So it's at least two, you're going to have to catch the animals at least twice, once to get the blood, and the next time to sort them or do whatever you're going to do with them. And then the other one is chute side. That's the IIdex Alertus. And that one is very well, fairly new, very new, I'd say. The test does run shoot side so it can potentially be just one just catching the animal once. Ah, which is a plus, it's marketed currently as being ninety-six percent accurate and so ultrasound and palpation when done by a skilled technician, are well above ninety-nine percent accurate. And so you potentially would give up a little accuracy, going to that test. So now and I the way they have described it, there's a potential. So when you do a very early pregnancy test whether it's blood, palpation or ultrasound. When you're early in gestation, there's a higher risk that there would be natural pregnancy loss before calving. We know that the preponderance of early embryonic loss is very early in gestation, so the first couple of months. So if you routinely, so just as a hypothetical, if you were to routinely pre-check at thirty days. You'd expect probably five-ish percent pregnancy loss before calving, where, if you routinely preg-check at six months you'd probably expect less than one percent pregnancy loss by calving. And that's just, that's nothing to do with the technique at all. That's just simply the natural pregnancy attrition throughout a group of cattle for a set period of time. So with that Altertus system we market as ninety-six percent accurate. It's possible that the test can actually, would actually read negative on a cow that does have an embryo in her right now, but it's not going to make it. So that's one potential explanation for that number. So it might be a little less accurate. But there's a chance that it's actually more accurate at finding the pregnancies that are going to go to term. So I can't say I don't think anybody knows yet which it actually is and so that would be a question that will probably be answered in future years.

**Olivia Amundson:** That’s really informational. Kiernan, did you have something you were going to add?

**Kiernan Brandt:** No, I was just going to say that's a good idea for ah another podcast down the line. We'll have to do a strategies for minimizing embryonic loss, because, yeah, i'm pretty sure I know it was in pretty much every section of my light review and my thesis, and I know I was in Olivia's because I cited her in the in the papers, and it's still something that, you know industry wide, beef, dairy everything. I mean, we're just still trying to tackle that hurdle at that, getting that percentage early in gestation down. And yeah, the battle continues. So you guys work on anything like that at the Meat Animal Research Center, or is the lens on other things currently?

**Dr. Halden Clark:** You know I just recently read through all the current projects, and I don't think there's anything specifically focused on that, although there was a not, and so then, so that's the end of that answer actually, so, not that I know of here, though I did come across a nice review article on the topic from 2021 so there is there are some things being considered wider than here specifically, but elsewhere within the beef industry. But I know people are thinking about it and working on it because it's so interesting to find that maybe ninety or more, percent of breedings result in fertilization and conception of that, you know, we would expect roughly two-thirds of an inseminated like correctly inseminated cows that had ovulated to result in a pregnancy that goes to term. So somewhere along the line almost a third of those pregnancies don't go to terms. So yeah, that is very fascinating. Many of those are gone by thirty days anyway, and so they don't really cause too much trouble for our pregnancy, checking by that stage. But it would be nice if we could recapture some of those, or at least find out why those are being lost if it's it like what percentage of those are chromosomal anomalies and other things that are not compatible with life. And so we actually don't want, we really can't actually have those animals in our herd, anyway. But I'm kind of talking beyond my level now, so I’m going to slow down, real it in and.

**Olivia Amundson:** I was going say, I mean, that's pretty similar in even humans isn't it that there's a lot of pregnancies that are lost before ah menses actually happens just because of some of those chromosomal deficiencies and things like that. I don't I personally again, I’m probably talking too much, too, because I don't know how much research has been done on that on the human side. But if it's even a thought in the beef cattle side, I mean, if there's it's just a really interesting concept.

**Dr. Halden Clark:** I know there's work being done to basically better mimic the interuterine environment for our embryo transfers and embryo calves. I know that works being done currently, and that may shed some light on it. Some of the intrauterine factors if it's something simple like that, where we can somehow either better manage or better prepare the interuterine environment to promote implantation and the successful gestation of the calf those things we absolutely want to know.

**Olivia Amundson:** Well, we're wrapping up here on our time, Kiernan do you have any last questions.

**Kiernan Brandt**: No, I just uh yeah, like, say, thanks to our guest, it was a pleasure we’ll have to do it again. I've been talking about trying to get a group down for a tour of the Meat Animal Research Center and for any listeners that haven't heard of it. I mean it's pretty cool, and they're pretty friendly about doing tours and stuff, and it's a cool place.

**Dtr. Halden Clark:** Yeah, that's true. We do tours very frequently. We have a nice little bus, and happy to do it so if people would like to come down, have them get in contact with us, and that would be fine. So, thanks for having me, glad to be here.

**Olivia Amundson**: Yeah, thank you, Dr. Clark, and thank you to our listeners. This is another episode of Cattle HQ. And we will catch you on the next one.

**[Music]**