## Beefing Up Herd Health: Dr. Russ Daly

## Season 1, Episode 35

[Intro music]

**Kiernan Brandt:**

Welcome to Cattle HQ, a podcast from industry experts and progressive producers discussing cutting edge info about the cow/calf sector to keep cattlemen and women in the know and positively affect their bottom line. [Music]

**Madison Kovarna:**

Welcome to Cattle HQ brought to you by South Dakota State University Extension. I am Madison Kovarna, a beef nutrition field specialist based out of Watertown and joining me on this episode is a colleague of mine, Doctor Russ Daly. Doctor Daly is SDSU Extension’s veterinarian and the State’s public health veterinarian. He serves as a resource on animal health issues not only for other veterinarians in the state, but also industry allies, members and producers.

So, first off, Russ, I want to thank you for joining me today to record this and get some information out to our producers, and really, anybody who listens to this podcast about some animal health issues and really excited you took some time out of your day today to come with us. A lot of producers are always wanting to improve their operations and for some updating an existing herd health plan or developing a new one is one of those ways they move forward. In your opinion, what are some big ticket items to consider when creating those plans?

**Dr. Russ Daly:**

That’s a really good question. I think it comes down to what are the goals for each producer? Where are you at right now with your overall health in your herd? Where would you like to take it? I think we both know as people who work with Extension and work with producers, there’s a really wide variety of what people deem as adequate herd health, I guess. Sometimes you deal with producers and there are producers out there who really have a low tolerance for any kind of illness in their calves or their cows, any animals that are having a couple of runny eyes, that’s reason for intervention. Then, we talk to producers on the other hand who, you know, “How many cows have you lost before we call and try to get some answers?”

It depends on your goals. So, what’s your goal for herd health? Is it to prevent the big wrecks, prevent the death loss. That’s maybe the top of the pyramid in the worst case scenarios. Is it the absence of clinical disease or is it maintaining health for optimal productivity because there’s so many things that fly under the radar screen subclinically with cattle diseases that affect weight gains, and the ability of the cow to produce milk. and things like that. So first of all, what’s your goal? Where are you at right now and what’s your goal?

There’s so many aspects to health, and I think of – I probably would land in that herd health category as a veterinarian, as the absence of clinical disease. That would be my default to go to. Things like biosecurity, making sure we understand what diseases might be coming into our herd, a good vaccination program for those things that we can’t keep out of the herds and parasite control. Those are things that would be, I think important to that absence of clinical disease, but also I think herd health really means a lot more than just that. Parasite control starts to get into nutrition and the immune system and reproduction too. So, having a solid nutritional program, solid mineral and vitamin program, a solid plan for reproduction, those all really contribute to herd health as well.

To me, it comes down to bio security. How are we going to control transmission of diseases that might come into a herd, vaccination programs. Then, just realizing that there’s a lot more to herd health than just a vaccine program. That’s what I talk to a lot of veterinarians who, “How many of your herds are on a herd health program?” “Well, all of them are because we all have a vaccination program set up for them.” “Well, there’s a lot more to consider than just that.” That’d be the first thing is what are your goals. What do you want to improve and then what steps do we need to take to get there? I know that’s a general answer, but maybe that’s where we can get started.

**Madison Kovarna:**

Yes, I agree with you that it’s a sit-down conversation with not only yourself, but also really anybody else who’s involved with that cow herd at home and sitting down and talking about what you picture those cows to function like and to function like. I know we all want that silver bullet that says this is going to fix all the issues, and this is the only thing you need to do, but I think you hit on it super well of that it’s, in order to have a healthy cow herd, you got to have all the gears turning in the same direction and working together.

That nutrition plan plays into it, that vaccination plan, but also simply just a good management plan, how are those animals being handled? Are they in a high stress situation all the time where that can wear them down when that – if they do get exposed to something. It might have felt a little general to say. I always think it’s a good way to start is just starting from square one and starting at that oversimplified beginning essentially.

**Dr. Russ Daly:**

Yes. I think when I look at nutrition and vaccinations and things like that in biosecurity, I think we put a lot of emphasis on vaccination program, right, but I’ll tell you, and you know this too, most producers do too I think, is that a good nutritional program and a good biosecurity program, keeping things out in the first place, those things are going to make a vaccine program really look good or really look bad if you’re not doing them right. It all works together absolutely.

**Madison Kovarna:**

Speaking of vaccination plans, I know I can get guilty of this too of I look at maybe what the neighbor across the section’s doing, or someone that has all their ducks in a row and their cows look really good or they’re selling calves for a little bit extra at the sale barn of what their vaccination plan, what their herd health plans look like. But am I going to have that same plan as the next person over, or is that something that potentially even if you are only a section apart that your herd health plans look drastically different?

**Dr. Russ Daly:**

Yes, very much could be different. I think one thing, one way to look at things as far as especially the vaccination programs, is what’s your level of disease pressure in the herd? What I mean by that is how is your herd’s operation set up to make the incursion of disease either more likely or less likely? The first thing my mind goes to are, are you a pretty open herd? Are you a pretty closed herd? What I mean by that, an open herd, of course, we’re buying and selling a lot of cows, bringing in heifers in every year, buying bulls, maybe we have a feed lot that we’re buying calves to put into next to our existing cow herd versus a really closed herd where we’re raising our own replacements and we’re just using AI bulls. Those two operations, their pressure for disease is really different between the two groups.

You mentioned stress too. Are our animals under stressful situations as far as do we provide good weather mitigation, whether it’s too hot or too cold. How are we managing those animals through handling events? Do we handle them a lot? Do we handle them not much at all? When we do handle them, is that a low stress event? How do we wean calves? Those kind of things I’ll enter into that too. Knowing your operation, and maybe we’re not going to change that.

Maybe we’re going to keep buying new animals in from outside, but realize that the risks to your herd are going to be different than your neighbor who maybe has the same cattle and has the same environment and same weather and everything, but they run cattle in a different way and maybe don’t bring as many animals onto the farm, for example, to have that risk of new strains of disease coming in or a new disease altogether coming in. Your program, if your operation is just set up in that way, might need to be a little more robust. We might need to pay more attention to the vaccines we use. Especially the timing of those vaccines too, as opposed to somebody who maybe doesn’t have as much pressure from those diseases coming in, if that makes sense.

**Madison Kovarna:**

Yes, absolutely. You brought up a good point about if we’re going to be bringing in new animals like a lot of producers do, I always imagine it of when you send your kid off to kindergarten for that first year, it seems like they’re sick every other day and they bring some new bug home no matter what. I like to relate that back to bringing whether it’s a new bull, new heifer, new cows, whatever it may be, new steers in the feed lot, really anything of that they’ll need some time to adjust to the new environment, but also maybe potentially shed or stop shedding those packages they might bring in. In your opinion, what is probably the best length of time before we introduce a previous animal into our new herd? What is that isolation time or that quarantine time look like for those new critters?

**Dr. Russ Daly:**

Yes, I think that quarantine isolation period is really important. Of course, we’re seeing that kind of thing play out in the dairy operations with the high path avian influenza. As far as the length of time, let’s look at why we have that length of time. We’re wanting that length of time to be long enough for any tip for us to see any disease that might be brought in by those new animals, right? So, if they’re going to come with a clinical disease, it’s going to maybe take a while after the stress of moving to a new environment for that disease to show up. A lot of times, with our viruses and in bacteria that we normally think of, pink eye, foot rot, pneumonias, those kind of things, at least a couple of weeks. My standard is 30 days. It might need to be a little bit longer.

The other side of that is for them to stop shedding those agents that come in with them from their previous operation, so every animal has their own flora, microflora in their guts and in their nose and their nasal passages, their respiratory tracts, and they live with them and do fine with them but the stress of moving makes them shed those organisms more. If they’re strained and our animals ourselves, our host herd or home herd doesn’t have a previous exposure to, we want to make sure that those animals have that time to calm down. In most cases, 30 days is going to be adequate.

My standard answer is as long as you can. At some point, you’re going to have to acclimate them into the rest of the herd and you can’t keep them in their bubble forever and you can’t really maintain separate herds forever. At some point, you’re going to have to commingle them. The other thing to understand too, is there are some diseases that we can’t isolate them long enough for to get them over the things they might be bringing in. The example that I think of first off with that is animals that are persistently infected with BVD, bovine viral diarrhea virus. If they’re persistently infected, they’re going to be shedding that virus every day of their life and there’s no length of period, of isolation period long enough for them to stop shedding.

So, that’s when testing new animals comes into place. There’s a few diseases that we can think about testing for, BVD is one of them. That’s important to realize that there are these persistent carrier states. Anaplasmosis would be another one too. Either testing or doing some other kind of treatment depending on that particular disease is going to be important too with all this because there are some of those issues that even 30 days, even 60 days wouldn’t be long enough for.

**Madison Kovarna:**

Yes. You brought up a good point because if I remember right from when you used to teach me when I went to SDSU for my first degree, we learned about those BVD persistent carrier cattle. Isn’t it true that if a cow is a persistent carrier, she can pass that on to a newborn calf that maybe wasn’t exposed necessarily the traditional way?

**Dr. Russ Daly:**

Yes, absolutely. It doesn’t happen too often. I mean, think about the animals we would be bringing into a herd, a replacement heifer or a cow, bred cow, for example. Yes, if that cow is persistently infected herself or that heifer is persistently infected herself, not only are they going to be a source of virus for everybody else in the herd, but when they get bred, if they get bred, and they probably will, they’ll have a persistently infected calf too. Then, it just becomes a spiral downward kind of thing where there’s more and more virus and more and more persistently infected animals in a herd. That’s when we have, I talked about the big wrecks. That’s when we have the big wrecks is maybe not that first year, but afterwards when things get to that critical mass to cause some real obvious problems.

**Madison Kovarna:**

I think that based on just the fact that these problems or these big wrecks can really, seemingly almost come out of nowhere, and I think that’s where it’s super important to make sure that we’re having those trusted relationships with whatever veterinarian you choose to utilize for your operation because they’re ultimately going to be the ones that can have that outside look on your herd and maybe see some things that we’re not either trained to see and notice. Also they’re just going to be the ones that can help get us out of it before we end up losing some cattle to something that if we would have caught it a couple of months earlier and had some time to work on it, that we might have been able to fix that.

Speaking of, you brought it up a little bit earlier and we’ll stay away from the big political buzz of the avian flu that’s really causing some havoc for our friends in the dairy industry, but have you heard of anything buzz wise or some big things that we could potentially be on the lookout this season on the beef side of the industry?

**Madison Kovarna:**

We’re getting into, depending on when people are listening to this, of course, we’re getting into summer months and those always bring with it their particular set of challenges. The one thing that I think is becoming more and more on our radar screen is veterinarians and people here at the diagnostic lab and in Extension too is a disease called anaplasmosis and we haven’t really had to deal with that too much in this northern climate that we live in here in the Dakotas, it’s normally thought to have been more of a southern disease. The Southeastern United States where it’s endemic.

This is a bacteria, bacterial disease that affects red blood cells of the cattle. What we have in those cases then is if an animal is infected, their red blood cells are going to be impaired and not able to carry oxygen. So, these cows will become anemic and we can have clinical disease, clinical anemia and death loss, as well as subclinical performance things or reproductive problems as well. The interesting thing about this disease is it’s carried by a tick. Ticks that over winter and can have that year-round exposure to cattle, that’s where we really have the worst problems.

We’ve really never thought too much in the past that we’ve had the climate here where ticks can over winter and cause these endemic or resident herds in the Dakotas that have anaplasmosis, but it’s becoming more apparent over the years. It’s still not a widespread thing, but more and more herds are reporting this to be a problem. Now, traditionally, anaplasmosis this disease has always been something that when you dig into the herd history a little bit, well, it’s always been something, “Okay, we bought some cows from Oklahoma. We bought some cows from – bred cows or bred heifers from Texas.” Now, maybe that’s where it got started, but we do have some herds where it’s pretty apparent that our native cattle have become affected as well.

We just talked about isolation and testing. This would be a perfect thing to be able to test for these animals before they come in. There are some things we can do as far as treatments as a bacterial infection. In some cases, we can use antibiotics to help manage this infection. But first of all, just knowing what you’re bringing in and knowing the potential for that disease is going to be important because as I think we all understand is that as time goes on, these insects, these vectors that carry these diseases, are probably just going to become more of an issue over time and not less of an issue, that’s for sure. That’s the one thing I think that talking to vets and diagnostic people, it’s more on our radar screen and probably will be for the future to come.

**Madison Kovarna:**

As we look to helping our friends down South from Texas recover from that wildfire that hit them earlier this year, that’s a really good point that you brought up that if this anaplasmosis is coming up from potentially some cattle that have just lived in the South their whole life, that if we do want to purchase some of those coming up on the pipeline from the fires that this is just something that we should look out for. Speaking on that too, if I am looking for some reliable or trusted information, maybe outside of my veterinarian, maybe they’re busy, can’t answer my phone call or something, where are some good places to look or places to contact to find this information on some of these, either some basic health questions or maybe some of these recent events that are happening?

**Dr. Russ Daly:**

That’s always a really good question. I spend a lot of time with our students, and what are our trusted sources of information. First of all, I think I’m a big fan of Extension as I know you are too, Madison, that the reason why I think Extension is such a good source, and not just at SDSU, but other states as well is that they tend to be unbiased. They’re not trying to sell you something necessarily. Not to say that vaccine companies or antibiotic companies are unreliable sources of information because they can put out some very good information too, but so often, in the back of my mind anyway, is, “Okay, here’s this information, but what are they trying to sell me at the same time?”

Now, definitely things like when it comes to specific disease, anaplasmosis for example, animal health companies are going to be some pretty good sources of information too, but I would first look for the E-D-U sites. If you’re going to do Googling, the E-D-U sites or the Gov, .edu or .gov, those unbiased sources of information that aren’t necessarily trying to sell you something, but still have some I guess some weight behind them as far as their recommendations. If I put something, if you put something out through Extension, it’s got to be pretty solid stuff. In the same way with our governmental agencies like USDA or APHIS, when it comes to these diseases too, which those two would be very good sources of information as well.

Those are the places I would start. Gather your information and then bring that to your veterinarian, I think, is a really good way to go about things is, “Okay. Here’s what I found now. How does this relate to what you understand as a veterinarian and what’s going on in the local area, in your practice area? Knowing my operation, how does this information fit in with something that I can do better in the future for herd health?”

**Madison Kovarna:**

I think too, when we’re looking on the Internet, the Internet is such a powerful tool, but it can also send us down some rabbit holes is if you maybe find something on a website, just doing some fact checking into the author who published it, maybe do a quick search on their name. I know a lot of our Extension stuff gets pulled out to several different magazines or different websites, I’ve seen a couple of ours on like feedlotmagazine.com or those type of places, but they always list our names.

So, just seeing and finding out who published those and definitely taking some of the information out and maybe plugging it back into Google and see if there’s someone else who agrees with the things that either you or I might be writing as well to see maybe what other opinions are out there. Then, ultimately, having that sit down conversation with your veterinarian I think is something that could provide not only you but potentially them some information too that they can use off into the future as well.

**Dr. Russ Daly:**

Right.

**Madison Kovarna:**

This question always seems to sneak up on us as we’re running through the year and I can’t even hardly believe that it’s the middle of summer now, and it feels like New Year’s Eve was just the other day to me. I’m sure you probably feel the same way on that as well. While we may have a while to go, weaning time is definitely going to quickly sneak up on us, what are some ways or things that we can do to prepare ourselves and our herds for a successful weaning season?

**Dr. Russ Daly:**

I think that preweaning preparation and that planning is so important, and I know many of our producers have done this and my clients did this and have done this very successfully. It’s backing up the calendar three to four weeks before we wean and this is the time to get those preweaning vaccinations into them. We still deal with bovine respiratory disease as our biggest problem, postweaning, whether we’re keeping those calves or whether somebody else is going to feed them for us.

Making sure that our vaccines that we’re using are appropriate and the timing is appropriate too. In a lot of cases, it’s going to depend on did you give those calves something going out to pasture say at branding time or turn out time. If you didn’t, that’s still fine but you might need to make sure, depending on your vaccine, to get a booster into them around the time of weaning. In some cases, we don’t need to do that. That timing of your vaccines is going to be something to look at and just double check with your veterinarian to make sure that we’re doing this appropriately.

In most cases, if we do need a booster, it’s going to be three to four weeks after the first one, first dose, but in some cases if we gave those vaccines at branding time or turnout time, we might be able to get away without a shot at weaning time, or around the time of weaning. If we can avoid that at weaning time, that’s always the best but that’s something depending on your products, modified live versus killed would be one consideration depending on your products. Check that over with your veterinarian.

Then, I think is it time to think about how you wean calves. Is it the abrupt weaning you’re still doing and jerking the calves away from the mother and kind of ripping the Band-Aid off, so to speak, or are you thinking about, can you do something like fence line weaning. Those are the things to be thinking about right now is how can we make that process better and less stressful for the calves, as well as making sure that they’re prepared immunologically for the challenges that might present themselves after that stress of weaning.

**Madison Kovarna:**

**I think another you can speak on this as well, I’m sure, but the moment we poke those** calves, it doesn’t mean that that vaccine immediately made them – I don’t want to say immune because that’s not the right word, but it doesn’t support them right away. It takes some time for that vaccine to start doing what we want it to do and prepare those calves, and I’m sure there’s a window of time where it’s the best time to give it, so many days before you need it to be working essentially. Do you have any thoughts on that piece as well?

**Dr. Russ Daly:**

Yes, definitely. We’ve got to give those vaccines some time to work and generally, at least a couple of weeks, well, at least a week to two weeks before we need the vaccine. In this case, it’s going to be, the weaning is going to be the stress, and that’s going to precipitate the disease problem. At least a couple of weeks to get the biggest response from the vaccine. You’re right. Exactly. It’s not something that they’re immediately immune as soon as you pull the needle out of the hide.

Now, I wouldn’t say too though, on the booster side of things, if you do have a vaccine where you give a booster that’s a lot less time to get a good response. So, that’s why I say, if you have a program where you give vaccines three weeks preweaning and maybe that’s their first dose they’ve ever got, maybe you didn’t get them vaccinated at branding time or turn out time. If that’s the first dose you give them, yes, it’s going to take a couple of weeks at least for that to kick in.

So, you don’t want to give it too close to weaning time, but given time, given enough time for that first one to sink in and then booster-ing even if it’s around the time of weaning, that’s a pretty quick, what we call anamnestic response or a memory response. That doesn’t take as long. That’s only a couple of days maybe. Realizing that things take off a lot quicker after the booster can be valuable to keep in mind too.

**Madison Kovarna:**

I think another big thing to mention too when it comes to vaccine efficacy or how well they work is how we’re handling them before they go under the hide and go to work is are we handling our modified lives correctly or maybe is there something that we can do a little bit different and with those killed vaccines, maybe we have a little bit more flexibility. I don’t know if you want to speak a little bit briefly on that vaccine handling piece or maybe what we can do while we’re working cattle to keep those vaccines at peak performance.

**Dr. Russ Daly:**

Yes, absolutely. If we don’t treat those vaccines right, it’s kind of a waste of time to give it to them and it’s not going to do what we want it to do. It’s important when we have these modified live vaccines, and most people use them too, you have the two bottles you have to mix up, one thing to realize is right after you mix them up, the clock starts ticking on that vaccine’s viability, so we want use that vial, that mixed vial up within an hour at best.

That’s assuming we keep it cool while we’re out there working the cattle. We can be working on some hot days. You want to keep it out of the sunlight. Want to keep it in a cooler with some ice packs. Trying to keep it at refrigerator temperature all the way from the minute you buy it at the vet clinic to transporting it, taking it home, putting in the refrigerator, and then from the time you mix it up and start working cattle, you got to keep it cool as well. Vaccines are basically proteins and so we want to keep them at refrigerator temperatures to preserve them as much as possible.

If we happen to mistreat a modified live vaccine and kill the bugs in the modified live vaccine, that didn’t just make it a killed vaccine and everything’s still fine. You don’t have enough germ anymore in that dose of that modified live that you ruined to make it work as a killed vaccine. Killed vaccines have a lot more of the germ in them, even though they are inactivated and they have adjuvants, which are chemicals that help get the immune system’s attention. When you use a modified live vaccine, it’s really important to keep that viability preserved from the time you get the vaccine purchased to the time it gets into the animal.

**Madison Kovarna:**

With that, I’m guilty of it too of when you go to the vet clinic and you buy that bottle of vaccine, it’s a quick drive home so you throw it up on the dash and you take the 20-minute drive maybe to get home or longer, depending on where you’re going. Those dashes of our pickups or our vehicles can get pretty hot pretty fast. There’s an image out there on the Internet of a temperature reader on the dash of a pickup, and it was reading over 96° and if we would have had a vaccine up there, it pretty much would have been unusable by the time we got home. That’s something if you’re going to go spend the money on it, let’s make it last as long as we can.

You spoke too on while we’re working cattle in keeping those vaccines as close to temperature as we can, I’m sure we’ve all seen them, I’m pretty jealous of them. I think they’re pretty cool. The really fancy coolers that you can buy from your animal health companies that have the little wells that you can put your syringes in to keep them cool. I’ve seen people make them just out of a Styrofoam cooler that you can get out of a box or you can buy from Walmart or wherever you may go. You can just cut some holes on the side of that to keep your syringes cool. So, these handling solutions don’t have to be super expensive, but they definitely will save you from those wrecks down the road if we do spend the extra couple of dollars on those little things right away.

**Dr. Russ Daly:**

Right. I like those coolers because you can use them. In the hot weather, you put ice packs in the bottom of them. Then if you’re working cattle in freezing weather, you want to keep your vaccines, so it’s the other extreme, right? You don’t want them to freeze either, so you can put hot packs in. It doesn’t have to be fancy. In practice, we got by with just good old Styrofoam coolers and just making sure that we’re keeping that vaccine, again, at refrigerator temperature, not too hot, not too cold and keeping those needles from freezing in the wintertime too. I know we’re probably offseason to be talking about that, but those little things can make a big difference.

**Madison Kovarna:**

Yes, it might be the wrong season to talk about it, but it’s definitely a good point to bring up of it’s both ends of the spectrum. We don’t want things to get too cold or too hot. Speaking of too hot, as we enter the tail end of summer here and moving into the fall, our temperatures are going to increase pretty starkly, at least, it could get pretty hot pretty quick. What are some things that we can do as herd managers or people with livestock to help them get through these heat events, maybe some management tips there from you.

**Dr. Russ Daly:**

That’s always challenging, right? Especially when we have cows out on pasture and bulls. Yes, making sure they have water sources I think is the main thing, making sure we’re paying attention to where they’re drinking water and hauling water if we need to. That’s probably the key. Providing shade. The bulls and their performance, that could be a whole other discussion podcast about managing bowls during hot weather too but we know that not only can they be just more or less apt to breathe in that hot weather and their ability to produce a good semen is impaired as well. I guess pay attention to water sources and providing shade whenever possible. I know easier said than done sometimes on our big pastures but at least to keep an eye on them and intervening as much as we can when we can.

**Madison Kovarna:**

You brought up water and this can be a soap box of mine, so I’ll try to keep it short so it can get pretty in depth. With water too, sometimes we can provide them water, but it’s also looking at the quality of that water as well. There’s some water sources that will look crystal clear to the eye and look like you dumped bottled water out in the grounds but those can actually cause them problems if that water quality isn’t up to par there as well. We can end up causing some more damage too. As we get into these hotter weather situations and year round even, the water quality discussion becomes super important of bringing those in. There’s a list on our website, which I’ll list here in a minute.

On our website that talks about all the places you can bring those water samples for a quick test just to see the quality as a big picture. If we see an issue, then we can send it off somewhere else but super easy to test. Most or all of our regional centers with SDSU Extension have someone trained to do that. We can definitely answer some quick questions. I hate to say it, but I think we’re running close on the end of our time today. So, Russ, are there any closing thoughts you want to leave us with or words of wisdom?

**Dr. Russ Daly:**

Well, I just think, yes, everybody’s goals can be different for herd health and it does come back to having those trusted sources of information, your veterinarians are great. I think SDSU Extension and other State Extension services can be a really important information too. I think the main thing is if you’re thinking about a change in your operation or a change in your vaccines, don’t do that without making sure you discuss that with somebody and think about the ins and outs of what that decision might mean for you and the health of your animals.

**Madison Kovarna:**

Well, with that, I want to thank you Doctor Daly, for joining me on this podcast. It’s been a great conversation. I always love talking about herd health for producers and those that are involved in our industry as it really becomes the center of how our cows function and how just our herds in general, no matter what they’re doing. It’s something that needs to stay in the center of our plates to ensure that we can continue raising that high quality beef products for everyone in the nation and across the world. With that, this has been Cattle HQ brought to you by SDSU Extension, headquarters for all things beef cattle. Visit extension.sdstate.edu for the latest beef information. Until next episode. Stay curious and keep learning.

**Kiernan Brandt:**

[Music] Thank you for tuning in to this episode of Cattle HQ brought to you by SDSU Extension, headquarters for all things beef. We invite you to visit extension.sdstate.edu for the latest beef information as well as subscribe to the show on Spotify. You will also find show notes and resources from today’s episode. Until next time. Remember, success is not a goal, it’s a byproduct. [Music]

[Outro music]