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## Season 1, Episode 9

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**Adele Harty:** Adele Harty: Welcome to the first episode of cattle HQ brought to you by South Dakota State University Extension. I am Adele Harty, cow/calf field specialist based out of Rapid City, I'm going to be your host today. And we are going to be visiting about the importance of nitrate testing feeds and how a couple of South Dakota producers have had therefore just tested. We're going to go ahead and get started and I’m going to let my guests introduce themselves. Give me your name, a little bit about where you're at and why nitrates and nitrate testing is an important issue for you. I guess I’ll go ahead and let Pete start.

**Pete Anderson:** I’m Pete Anderson and we live in North Western South Dakota. And we do have quite a little nitrate trouble, over the years we have, and that's the reason we test for it.

**Adele Harty:** Great, Levi.

**Levi Swanson:** I’m Levi Swanson, I’m from crooks just north of Sioux Falls a few miles. We typically don't have a lot of nitrate issues over in our area, except for years, like this when it’s extremely dry.

And this year we noticed some big, big differences with nitrates being in our crops out here.

**Pete Anderson:** Oh you have.

**Levi Swanson:** Uh huh.

**Pete Anderson:** I think up here, we’re a lot drier on normal years, you know is the reason we see it.

**Levi Swanson:** Yeah, and typically seems like over here on the eastern side we have enough subsoil where you can push those forage crops through and you won't see much of a difference, but a year like this, no rain in May, no rain in June, I mean nothing to really add up to anything really made a big difference in these in these forage crops over here.

**Pete Anderson:** Uh huh.

**Adele Harty:** So, to give our listeners a little bit of perspective can you guys share what your annual average rainfall is typically in your area and maybe what it has been this year or close to anyway.

**Pete Anderson:** I guess I don't really know what our average is up this way.

**Levi Swanson:** I think over here we're typically around the 20 to 25 inches give or take in all. But right now, Oh, I think it was a month ago, I heard on the radio and a 12 month span from last month we've only seen nine inches over here.

**Pete Anderson:** Oh wow.

**Adele Harty:** Ok, so you're about half of average or even less than that from the way it sounds.

**Levi Swanson:** Yep, we're pretty dry.

**Adele Harty:** Okay, so today we're going to talk about nitrates and you guys talked a little bit about why it's important to you and that you’ve each had some issues in the past, and this year with the drought conditions that we have had. One of the areas that I work in is livestock nutrition, meaning the nitrates are a big concern for keeping those, especially females bred, but then we don't want any animals to perish either. And some of the forage crops that we see the biggest issues in, are you know, oats, millet, sudan, sorghum, things like that and, and I think you both had some experience with oats and we'll talk about that a little bit more, but one of the services that SDSU Extension offers is a nitrate quick test for standing forages and Pete I know that you've utilized that service with some of your forage crops, so can you kind of tell us a little bit about your experience and maybe how you use that information.

**Pete Anderson:** Well, I go out and clip off about the height that I’m going to cut it. That's what I took to Robin and had her test it then for me. Just before I cut it to see if, it was it wasn't real good start with, so I wasn't going to cut it if I couldn’t feed it so.

**Adele Harty:** Great and so has this been a test that you've used multiple years, or do you see Robin regularly, or is it something that you kind of wait and see what the situation’s like and then decide what you’re going to do?

**Pete Anderson:** Well sometimes we’ve sent it in through like in Bison, I think it was Bob Crows and they’ll just send it into a lab and have it checked too, if I’m not in a big hurry to check it right away. They can get the protein and stuff that’s in it too back on that if you want it.

**Adele Harty:** Right, sending it into a lab for analysis is always good, because with the quick test that SDSU Extension has it's a qualitative test not quantitative so we just get a positive or negative result, but it allows producers to be able to say “Yes there's nitrate in this forage” or “no there's not” and then you can decide if there's no nitrate, you can go on out and hay that field or whatever your plans are with it. Okay, so Levi, I know that you haven't utilized the quick test in the past. Is that something that you would be interested in, or how might you utilize a tool like that, for your operation?

**Levi Swanson:** Well, now that I know you guys have that and having my sister so close to me and she's not mentioning that she had that, I’ll definitely use it.

**(laughter)**

**Adele Harty:** When you have a family member that can test it for you, that makes it very helpful for sure.

**Levi Swanson**: Yeah, yeah. I wish I would have known that, before I went and put all my hay up because when I knocked it down, it was an afterthought. But I didn't think I’d have any issues, because I had oats that were standing five to six feet tall and just looked great but when I went back and took some samples and sent it down to my nutritionalist and got the analysis back, it was a completely different story than what I thought I was going to see on the on the results there so.

**Adele Harty:** Yeah and then that makes it very challenging to figure out how to utilize that feed after the fact. Once it's already in a bale it's a little bit more challenging to make changes to what you can do on the production side of it.

**Pete Anderson**: How high was that then?

**Levi Swanson**: I don’t even want to say. (Laughter) It was just about touching 4000 parts per million.

**Pete Anderson:** Oh it was, oh man that is high.

**Levi Swanson:** Yep

**Adele Harty:** Yeah, unfortunately sometimes hard lessons learned, but you didn't send it to the commercial lab. So, can you talk through why you decided to send it to a lab and what you learned from that. I mean you kind of alluded to it already about how high it was and that maybe you won't do that again in the future, but just share a little bit about that.

**Levi Swanson:** Well, I always like to send in whatever forage I have put up just to see, you know, the nutritional analysis on it and after I put it up as hay I started wondering, a little bit more, I was like I wonder if nitrates are going to be an issue in this and sure enough, it was, but the main reasoning, why I send that in is just, I always like to know what I have because it's kind of a deal in my mind, you can't really manage what you can't measure, so I like to be able to measure everything that I have on the place and feeding a lot of TMRs back here, it's always nice to know exactly what you have going into that TMR.

**Adele Harty:** Right, it helps on the nutrition side of things, for those of us who are nutritionist to be able to develop rations that are going to meet the requirements of those livestock if we know what the actual analysis is of the feeds also. I want to get Pete, what's your perspective and how have you used the information? You know, why did you send samples to a lab and then, what did you learn from some of the samples that you sent in?

**Pete Anderson:** Mainly what I send in, we usually feed a combination of feed to our cows, alfalfa and grass, so I don't really worry too much about nutrition test on that.

**Adele Harty:** And so, just to give people a little bit of perspective, you know Levi said you're using TMRs, that's how you're going to be delivering feed to your cattle. When you're feeding your cows Pete, how is that, I mean, are you just rolling bales out, are you processing them?

**Pete Anderson:** Usually just roll the bales out to them and then we feed ear corn along with it.

**Adele Harty:** Okay. Very good.

**Pete Anderson:** And I kind of watch more for the condition on the cows. If they're not doing as good we feed better hay.

**Adele Harty:** Yep. No, that’s great. Always gotta monitor body condition of those cows and see which direction they're going. If they need a little more energy give them a little more energy if they're maintaining, that works great.

**Pete Anderson:** Weather’s got a lot to do with it to.

**Adele Harty:** It does, and we can change a lot from where Levi's cows are to where your cows are.

**Pete Anderson:** Yeah**.**

**Adele Harty:** For sure, definitely. So when you've sent those samples into the lab and I know Levi, you and I have had some discussions on how we can possibly utilize those oats that are higher in nitrates this year, but how have you used those results to make some management decisions, just to make sure that we don't cause any issues with our livestock, especially our pregnant cows.

**Levi Swanson:** Yeah I guess getting those results back and seeing what they were, you know, after I got those results back I kind of went out and talked to you and a couple other people and asked questions of you know how the nitrates would affect these animals, and you know what percentage, can you feed that, so I mean, it kind of helped me develop a whole plan as to where I was going to use that feed and how much of it, I could use in certain areas, you know with different animals. So that’s kind of what I got out of it.

**Adele Harty:** Yeah, and unfortunately with some of our nitrate test results, when they get to be extremely high, we can only utilize those feeds for calves, such as Levi's example of high nitrate oats. They're only going to be able to be utilized in a TMR for calves, otherwise our risk for causing abortions in some of those cows is too high. What about you Pete? How have you made some decisions or changed how you used feeds based on lab results.

**Pete Anderson:** We use like, we've had high nitrates other years and we grind our hay, but we grind it into two or three different piles, and the higher nitrate we just feed a little bit every day, but we feed it to the calves too. That how we use it.

**Adele Harty:** Yeah**.**

**Pete Anderson: After they calve, then we've gotten by feeding some of it too.**

**Adele Harty:** Very good.

**Levi Swanson:** At what levels do you stop feeding hay to a cow? You know at whatnitrate level is too high for those cows, a pregnant cow?

**Adele Harty:** Yeah that's a great question Levi, because what we consider safe for all livestock is 1000 parts per million and lower but at 2000 parts per million, we have to stop feeding that to pregnant cattle at all. So that's a very narrow window to be able to utilize it for pregnant females.

**Pete Anderson:** They don't recommend to blend it even at that high, do they?

**Adele Harty:** No, at 1000 to 1500 parts per million you limit that to 50% of your ration for pregnant animals. From 1000 to 2000 parts per million you limit it to 50% of the ration for all animals. Pregnant animals are going to hit that 50% level earlier, right at 1000 parts per million, and then after 2000 you don't want to feed that to pregnant animals at all. Then 4000 is the upper threshold of feeding to any livestock because we can't effectively blend it or safely blend it down well enough to make sure we don't have any hotspots that would be detrimental to those livestock. As you guys think about your own situations, your own experiences, you know, I think about a lot of the quick test results that we've had this year, and you know surprisingly we've got quite a few corn samples that I’ve tested because I’ve got producers who are looking at either baling standing corn or are already making silage and surprisingly those corn samples that I’ve tested are all negative for nitrates, which I don't have an answer for that. It's really surprising, but you know, what advice would you give other producers who are maybe concerned about some forage crops or corn or whatever else, as they're looking at nitrates and considering your own situation and knowing what resources are available?

**Levi Swanson:** I guess what I would say is take all the tests that you can. Figure out what you have and figure out the best solution for what you're working with. I mean, as for us back here, you know, we can at least chop and ensile and hopefully get some of those nitrate levels down in those piles as it ferments and everything. Knowing what you have is the biggest thing. I mean don't go out and feed just whatever without knowing what's there.

**Pete Anderson:** Yeah.

**Adele Harty:** Exactly, so Levi you brought up a great point there, as far as being able to utilize that higher nitrate corn for silage and being able to break down some of those nitrates through that fermentation process. I think that's really important, because we can lose or decrease our nitrates by approximately 50% if that fermentation process occurs correctly, but we have to make sure the moisture is correct and that that pile is packed good, so that that nitrate can be converted into ammonia in that anaerobic environment. One of the things that we need to think about or consider this year is that drought stressed corn can be kind of deceiving on how much moisture it has in it. Don't be getting too antsy to chop silage, because it may be too wet and then, if you do have high nitrates may not get that to decrease as much as you would like, in a normal year.

**Levi Swanson: What about balage, you know wrapping bales?**

**Adele Harty**: Balage is going to be very similar to silage because you're going to go through that fermentation process as long as your moisture is right, it's an anaerobic environment. If you do have the nitrates, it would break that down to ammonia. Oftentimes I hear of producers talk about prussic acid and nitrates and they act very similar in the animal, but the prussic acid is going to be concentrated in the leaves of the sudans and sorghums, whereas nitrates highest concentration is going to be in the lowest one third of that stalk. That's why, if we're looking at harvesting a crop and we know it's got some nitrates in it, but we can adjust cutting height to a little bit higher to decrease our nitrate level. Whereas prussic acid, once that plant is frozen, those cell walls rupture, that hydrocyanic acid is released you give it about 10 days and it's safe. After a frost, nitrates is nitrates, that's where it's always going to be. It's never going to decrease.

**Pete Anderson:** It isn’t?

**Adele Harty:** No.

**Levi Swanson:** Do we ever seen any nitrate issues in alfalfa crops?

**Adele Harty:** That's an interesting question. I personally have not, but based on some of the literature, it does show that we could see high nitrates in alfalfa crops, also sweet clover. And so, depending on the situation, it might be a good idea to have it tested. It's not one of the crops that's high on the list for nitrate accumulation, but based on the literature, yes, you can have it.

**Levi Swanson:** So I was curious about that, with our alfalfa crap back here, you know typically we can push a ton and a half to two tons per cutting and get four cuttings back here. We've only been getting half a ton and that just kind of struck my curiosity. Was are we going to see nitrate issues in the alfalfa back here, if guys are putting it up as dry hay?

**Adele Harty:** I would be really interested to see, if you do send a sample in, I would be interested to see your results and what those nitrates might be. I don’t know. This year, it’s interesting. Well, for more information on nitrates and some of our nitrate resources, we've got those available on the SDSU Extension website. We've got a publication there that lists the levels of nitrates that you would get back from your feed analysis and how you can utilize that feed in rations for cows and calves and once we kind of hit that threshold when we can no longer utilize it for cows. If you have any more questions or any topics for future podcasts, please email myself, Adele Harty, Robin Salverson, Olivia Amundson, or Kiernan Brandt. So thank you all for listening. Once again, this has been cattle HQ brought to you by SDSU extension visit extension that St state.edu for the latest brief information.

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