VOL. 1 ISSUE 8 · OCTOBER 2021

CATTLECAL NEWSLETTER

ANNOUNCEMENTS

Welcome to the CattleCal newsletter for October 2021! In this issue we have exciting information on dry rolled corn, the career and research of South Dakota State University Professor Warren Rusche, and a look at a study examining the effect of delayed implanting on Holstein steer performance, carcass characteristics. If you would like to hear more detailed conversations about the articles in this issue look for our CattleCal podcast on Spotify. Descriptions of this month's episodes and a link to the podcast can be found on page 3. If you have any questions, comments, or would like to submit a question for our Quiz Zinn segment, feel free to contact us. Our contact information can be found on the last page of the newsletter.

This issue:

THIS MONTH IN RESEARCH

This month we continued our two research projects as well as collecting respiration rate data. We also began collecting pen mud depth measurements to look at the impact of mud on calf-fed Holstein performance. We saw a decrease in performance over the past 28 days with ADG lower than previous months. We re-implanted all steers near the middle of the month and look forward to seeing some improved gain. In September we saw average maximum temperatures of 103° F and average minimum temperature of 73° F.

PERFORMANCE SUMMARY

Body weight (d 195)	985 lbs
Body weight (d 223)	1039 lbs
ADG	2.26 lbs/d
DMI	17 lbs/d
F:G	6.38

September 2021

October 2021

CATTLECAL PODCAST OCTOBER EPISODES

BONUS EPISODE - CCP#029

In this episode, we discuss some research updates on the research we are conducting at our facilities at the Desert Research and Extension Center.

Quiz Zinn - CCP#030

In this episode, we asked Dr. Richard Zinn about dry rolled corn - the benefits and drawbacks.

Career Call - CCP#031

This week Brooke Latack and Pedro Carvalho called Dr. Warren Rusche, an assistant professor in the Animal Science Department and feedlot extension specialist at South Dakota State University, to talk about his path to where he is today.

Research Call - CCP#032

This week Brooke Latack and Pedro Carvalho called Dr. Warren Rusche to discuss his research related to feeding hybrid rye as a substitute for corn in a feedlot diet.

Feedlot Research Call - CCP#033

This week, Pedro Carvalho and Brooke Latack discuss research looking at the effect delay implanting on Holstein steer performance.

Listen on Spotify at this link:
https://open.spotify.com/show/6PR02gPnmTSHEgsv09ghjY?si=2zV59nGbSE2mf8DiOqZLhw

Have any questions, comments, or suggestions? Want to send in a Quiz Zinn question? Contact the creators through the below email or through their social media profiles.

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What are the benefits, drawbacks, and things to consider when feeding dry-rolled corn in a feedlot diet?

Advantages of dry-rolled corn

The feeding of stem flaked corn is something that began in the late 1970's. Prior to that time, dry processed corn was the main feed ingredient. Alternatives are high moisture corn and perhaps cobbage. Advantages of dry processing corn is the machinery requirements and costs are considerably less with less technical knowledge of the equipment than steam-flaked corn. If the feedlot were to decide to go from dry processing to steam flaking corn, they would need a lot more expertise in the feed mill and considerably more expensive equipment. Another benefit of dry processed corn is the speed at which it can be produced. When flaking grain, mill operations can be extended because of the added time it takes to adequately process the grain. One additional advantage of dry-processed corn is that less forage can be fed in the diet. If we have a diet with coarsely ground corn, we could get away with 4-5% forage NDF, but with steam-flaked corn you would need 7-8% forage NDF. This would be an advantage in areas where forage is hard to come by.

Disadvantages of dry-rolled corn

The disadvantage is that the difference between dry-processed and steam flaked corn is at least 13%,especially with high corn prices. So, if you choose to feed dry-processed corn you're adding at least 13%. When steam flaking corn, the benefit goes up as the amount of hard endosperm or hardness itself (due to storage, etc.) in the corn goes up. For example, we've done studies with corn that has 50% or more hard endosperm. When steam-flaking there was no difference between high endosperm corn and conventional corn. But with dry-rolling the difference between high endosperm and conventional corn is greater. As you increase hardness of the corn, the disadvantage of dry-rolling increases. A flinty corn or corn that has a high endosperm would have an energy value of 2.05-2.09 Mcals/kg, where conventional corn would be 2.18 Mcals/kg for dry rolling corn.

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QUIZ ZINN

Dry-rolled vs finely ground corn

Because of the difficulty digesting the endosperm, the tendency is to want to ground the corn very finely. The thought is that when the corn is ground more finely, the energy value of the corn will increase. In practice, this isn't what actually happens. There are numerous studies that show that from the standpoint of animal performance there is a slight disadvantage using finely ground corn vs using a coarsely ground or rolled corn. Rate of passage of the finely ground corn through the rumen will move faster than dry-rolled corn. The initial fermentation rate of finely ground corn can be extremely high because the readily digestible portion of the corn is exposed without any special effort. With finely ground corn there can be an increase in digestive disfunction as well as issues at the feed bunk with separation of feed particles (fines falling to the bottom of the feed bunk). One of the things that should be taken into consideration is that if there is a high moisture diet (i.e. feeding silage) in combination with a dry-processed corn, then fine grinding the corn can have less of a negative effect. I still would not recommend it. It does not, in my opinion, have a positive effect. There are some studies where we see a benefit. We almost always see a increased ruminal digestion, but no performance benefits for finely ground corn. I'm cautious about finely grinding. It's a question I get all the time. My suggestion is that if possible then the convention would be to grind it or roll the corn so you get about 3-5% whole particle corn coming through.

CAREER CALL WITH WARREN RUSCHE

This week we head back to South Dakota to talk with Dr. Warren Rusche, an assistant professor and feedlot extension specialist at South Dakota State University, about his career and how he got there.

Where are you from and what do you do?

I'm from South Dakota. I'm actually recording this from my home office, which is no more than about 8 miles from where I grew up. With the exception of two years in grad school at Kansas State I've lived in South Dakota my whole life. Right now I'm an assistant professor and an extension feedlot management specialists at South Dakota State University. I've held that role officially for a month. Prior to that I have been doing the extension feedlot role at SDSU for the last five years.

Can you tell us when and how you decided to work with cattle, specifically with feedlots?

Well the cattle part of it is easy. I've always been a livestock kid from earliest memory. The favorite thing for me to do is to look at livestock, look at cattle, ride along checking cows. That was what I really loved doing. High school I did 4H and FFA. Our family had a sheep operation at that time. What I was best known for as a teenager was our sheep production. I always had a love for the livestock industry. The hours I had to spend on a tractor felt like punishment. I'd rather check cows, walk pens, fix fence. It was a logical career path for me to follow in the livestock industry. It wasn't necessarily the easiest thing to do in the 1980's. You've been kind enough not to mention that I'm a little older than most new career assistant professors, but I'm a product of the 1980's farm crisis. At that time in 1986 when I was graduating high school, going into agriculture was not necessarily the popular thing to do it or what your high school guidance counselor would suggest students do. But I'm certainly glad I did. It's opened so many doors and so many places for me. It's been really rewarding.

You grew up with livestock and that led you to want to go to school in South Dakota for animal science. What happened after that?

I got my undergrad degree from South Dakota State University. I wanted to be on the judging teams there and I was. I graduated in 1990 with an Animal Science degree. That is the last thing I'm going to tell you that actually went according to plan. Everything after that were things I said I was never going to do but ended up doing. The first of those was going to graduate school. I was a young broke college kid. I wanted to get a job, but the job market wasn't as attractive as I wanted. The things that I can interview for really didn't interest me that much. Some of my mentors and people I still consider friends and colleagues at SDSU were nudging me to encourage me to look into graduate school. I set up an appointment to visit with Dr. Corah and Dr. Cochran at Kansas State University. I just fell in love with the place. They let me at that time really explore what was one of my real interest areas, cow-calf production. The intersection between reproduction and nutrition. I worked with those two gentlemen and got my Master's degree in two years.

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CAREER CALL WITH WARREN RUSCHE

I still was quite sure what I wanted to do, so I did the second thing I said I wasn't going to and that was work in extension. I returned back to South Dakota to work in a small county right along the Minnesota border just north of Brookings. At that time we were not specialized, so I was the extension agent that handled everything from questions about your cattle to crop question to what weed is this in my lawn and everything in between. I will be forever grateful to the people of Deuel county, South Dakota for not taking one look at that green, 24 year old kid they saddled them with and not sending him home because he doesn't know much. Because I really didn't. I learned an awful lot, grew up an awful lot, and really enjoyed that work and that experience.

Then I had the opportunity to do the third thing I said I wasn't going do or didn't think I was ever going to get to. That was to go back home. At that time our family was custom backgrounding cattle and dad needed some help. He was managing a couple thousand head pretty much by himself. So, the door opened and my wife and I moved back home. Moved in on a Friday afternoon and Saturday morning start cleaning waterers, walking pens, and setting up feed bunks. We brought in about 1000 calves that fallen. It was kind of a trial by fire. In terms of my profession, it was sort of the PhD I got before I started graduate school in terms of that practical experience that's paid off for me when I'm working with producers and I can talk about things I've done and seen and view it from the lens of actually working in the business. We did that for about 13 years. I'm not going to go into all the details for this podcast, but working with family is challenging. It was pretty clear that our long term career path probably was going to mean we needed to do something different than the path we're on. It wasn't going to work long term.

In 2011 South Dakota State University extension announced a major reorganization of their extension system, going away from a county based model to regional centers with field specialists with more in depth training. Master's degree required, which worked out perfectly for me because I had that. I threw my hat in the ring, applied for one of those positions, and started as a cow calf field specialist in Watertown, SD in 2011. Did that for five years. The history of the feedlot extension position at South State University reads like a who's who of the cattle feeding business. Going all the way back to Dr. Danny Fox, Dr. Gary cool, Dr. Brad Johnson, Dr. Ben Holland, Dr. Eric Low, Dr. John Wagner. There's a long list of very successful people that didn't stay in South Dakota very long. We had someone and that person left after about a year. One of the industry stakeholders and I were visiting and sort of made the comment do you think you would need a PhD to work in extension in feedlot. I said I don't know. Probably not. That conversation turned into another conversation with the Dean of our college that asked me if I was interested in doing a PhD. My first response was, well, no. I'm too old. I was 47 at the time and talked it over with my wife. She thought I ought to it. I said you have no idea what that means, that's why you say yes. The president of our university was very persuasive, convinced me to follow that. It ended up taking about a year for all of all of the pieces to fall in place. I started my graduate program about five years ago and successfully defended in April. I applied for and was awarded the position of assistant professor shortly thereafter, and so here I am. Bit of a long, winding road and almost every one of those steps were things I didn't think I was going to do. Life is funny. You end up in spots you don't think to. It's really been an incredible run. I've been able to meet some amazing people. I can't wait to see what's next.

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CAREER CALL WITH WARREN RUSCHE

Your path is incredible and I think we could record a podcast about each one of those paths specifically. Talking about the challenge of working back home with family, I'm sure you have a lot to teach us about that one.

There will come a time when we're going to go into more depth at some point on lessons learned working with family and mistakes made, and you know. I'm not going to go into any details, but leaving was the easiest and hardest thing I ever had to do. I kind of lost my identity for a little bit. I had always viewed myself as a person managing 300 cows and at various times looking after another 1500 head of feeder cattle and beyond. For a little bit I lost that and I didn't quite know who I was. I can't necessarily wear my producer cap anymore. Agriculture is a funny thing. A person will do almost anything to chase that dream. I overlooked some things that, in hindsight, were red flags. I should've asked better questions earlier. I did make some decisions that, in hindsight, were less than wise from relationships in our family, with my wife, and my kids. I was hard on them. We had significant finance strains for few years and it was tough on the family. There were a lot of lessons learned. Somewhere down the line I'll go into a lot more depth, but that'll have to wait for another day.

I really want you to talk a little bit more about you deciding to go back to school at 47 years old with a wife, kids, and a job. How challenging was that?

Well, first off, anyone that has met my wife, it's pretty widely understood and realized that I married well out of my league. She's incredibly understanding and everything I've done she's been really supportive of. Those things we sometimes have to do whether in graduate School or in extension where it's not always conducive to be home when you want to be and things have to be done outside of normal hours. She was supportive of all of that. I had that advantage. I also had some advantages in that the university, we all were on the same page. I wasn't going to be the next great basic benchtop scientist. That wasn't what my interests were. That wasn't what South Dakota State University had in mind for me for me to be. Don't ask me to go pipette things. I've told the rest of the researchers I won't go into your lab without permission, I promise. There were some things that a more traditional graduate student might have had to do that I didn't. The other part, though, is one, we were doing at a slower pace. I was taking 6 credits per semester so that's why it took five years instead of three. The other part of it is helping now in my new role mentoring new are graduate students. The fact that I was a little more mature paid off. There's some life lessons that a person picks up in their twenties and thirties that eventually do pay off in your forties. So that helped. It was not necessarily an easy thing.

In some ways COVID was a blessing in disguise because it forced me to simply not have an alternative. We weren't traveling. I didn't have extension meetings all over. I wasn't going to a lot of places. It give me the freedom to focus on getting things right. I wrote basically all of the dissertation during COVID. In South Dakota I don't think we were as restricted as you were in California and in other places, but most of those big events got canceled. Our travel we just didn't do as much. We had the freedom to work from home, so from that standpoint I was able to focus when it might have been harder under more normal circumstances. I wouldn't necessarily recommend that just anybody say yeah you have a family, kids and a full time job. Go to grad school. Yeah, sure, it would be fun. I would say they want to think about it really hard. Think about it really carefully. But it can be done.

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CAREER CALL WITH WARREN RUSCHE

Dr. Zach Smith was the other part of it. We haven't talked about. Him arriving at South Dakota State University really was that final piece of the puzzle I needed. Anybody spending time talking to him, if you're not enthused about ruminant nutrition and feedlot production after visiting with him, I can't help you anymore. He's a bundle of energy. Our lab group is really dynamic. He brought me in as kind of a equal partner right away and gave me this freedom to get some stuff done. It's turned into a really great partnership and friendship and I don't know if I would have been successful without him on board as a mentor and a help in completing that program. I also have to mention that I have a great department head, Dr. Cassady. He was my advisor that always gives really good advice. He's one of those folks that if you're looking the pat back, he's not the warm fuzzy guy, but he's going tell you what you need to know. He's there to provide whatever support and resources you need to accomplish the objective. He's been great mentor. Those two gentlemen played a huge role in me getting where I'm at now.

What do you do in your job (day-to-day or just generally) and what are things that you didn't anticipate coming into your position?

Some of the changes, at least from a new role stand point, have to do with the difference in expectations from the 12 month non faculty exempt appointment to the faculty appointment. Today I need to get my Hatch Act proposal in so I can get the money they promised me. Some of those kinds of things. This position has a 20% research appointment which I didn't have before. Dr. Smith and I are co-advising one student. I will probably be on three or fourth committees. I'm also co-teaching the feedlot management class. I'm taking the lab portion. That's been in terms of a day to day challenge right now, that's probably the biggest one. My wife had spent about 22 years as a high school teacher. I have a completely new appreciation for everything she did. Being ready for class every week. I only have to do this for one class that repeats and she was doing five or six. That's been a bit of a challenge.

From a production standpoint. You deal with the issues as they come. Right now in South Dakota there are drought conditions. I've been spending a lot of time talking with folks about utilizing corn silage, how we deal with nitrates in feeds. We're so diverse in terms of our feeding business here in the state. We've got everywhere from cattle backgrounders to finishers and I still get called in on some cow calf things. So many of our cattle feeders also have a cow herd. One of the things of the job I love is that it's never boring. It's never the same. In our state I think we've got some of the most astute cattlemen and cattlewomen in the country. They're pretty serious about their business and they will challenge you with some really good questions. That's what inspires me and keeps me going.

How do you interact with producers and do you have advice on how to do that?

The thing that's got me as much notice as anything else is things that I've written that have gone on our website. I think you're well on your way with this podcast. It's a different medium and I haven't started utilizing that yet. Maybe it's just because differences in personality or preferences, but you have find some way and some mechanism to get your name out there so people know you.

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CAREER CALL WITH WARREN RUSCHE

One of the first things I did when I came back to extension 10 years ago was that spring I averaged going to a bull sale every week just so I could meet people. Some of them I knew. As we talked about earlier, I've lived here most of my life. Our state is small. 887,000 people. There are 15,000 beef producers and at some point I've been in 4H or FFA or college or done business with an awful lot of those people. But, not everyone knew what I was doing and even in a small state you don't know everyone. I think one of the things at first when starting out extension is those stakeholders and those key folks have to know who you are. I try to strike a balance between the technology side whether that's articles on the website or podcasts with the one on one human touch. At least in our state I would describe us as still pretty small town, rural America where folks like know who you are. One of the things I've tried to do is as best I can, though sometimes I stumble, is I try to provide as good information as I can. When I'm not certain I tell them I'm not certain. I'll tell them here some pros, here are some cons. Here's some things to think about. Then the decision is left in their hands. My hope is that I've provided some value and some additional information so they have a little bit of additional confidence in what they're going to do. Another part is that this is not a Monday to Friday, 8-5 job. At times you have to be able to step away. There's a young producer that calls me probably twice a week. First he apologized for calling me. I said this is my job to, but if I'm busy or I don't want to talk right then I won't answer. I'll just say leave a message. We'll talk later. There are times when it's really time sensitive and it's an investment on the line and they're looking to us as resource. I don't want to ever lose sight of the fact that these producers have options. I'm just on of them. In order for me to stay relevant, I need to be one of the options they can trust to get them information they need, when they need it, and that is has some value to it.

How important have mentors been to you career? How can people seek out mentors? How do you approach being a mentor to others?

I mentioned Dr. Larry Corah. He and I still talk on occasion. Probably not as often as I ought to. I can pinpoint the wanting to go back into livestock extension because of working with him in grad school. From there the next best extension specialist I ever worked with is Leon Wrage. He was the Mr Weeds South Dakota for ages. Absolute professional. Probably the most respected man I've ever met in terms of how farmers viewed the advice from him. Those are a couple examples of people I wanted to emulate. I really think you have to try to find those folks that are where you want to be and figure out how they got there. In some cases you're going find out some of your heroes aren't necessarily as heroic, and that's part of learning and part of growing up. I am trying to be that for some of these grad students now coming up. You mentioned that they are lucky to work with us. Quite honestly, Zach and I look at ourselves and we look at the seven people we have working for us. We think how did we get these good kids? I don't know how we did it to be honest, but they are a great group. There are going to be some names in 10 years from now they're going to be names people are going to recognize. They're going to do some amazing things. Good people attract good people. There's a saying somewhere that says the books you read and the people you hang out with will explain most of your success or failures. I've tried to be around those people that will help get me farther down the road. I hope that I'm that kind of person for some of these folks that I'm working with today.

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CAREER CALL WITH WARREN RUSCHE

What is your favorite food?

A good burger is hard to beat. Chili. I like Mexican food. I'll do some really sketchy things for apple pie.

What do you like to listen to?

Commuting back and forth I'll listen to satellite radio. It's usually some combination of the news, but if I want to just listen to music it will be Bruce Springsteen channel, the country stations or the highway. If I'm popping a CD in, then it's going to be things like Ashley McBride, Eric Church, Zac Brown Band. I got kind of an eclectic mix of things I like. Good music is good music.

What is something you would go back in time and tell your younger self?

I think all of us at some point we got a little bit of impostor syndrome. If I could go back and talk to my 21 year old self, it would have been don't worry about trying to follow the cool kids. You're going to be fine. You're going to have a little more confidence in your abilities than you give yourself credit for. Make sure to stay just a bit humble, too. I would tell the 21 year old Warren that you're getting to do some great things, but there are going to be some days that are going to be a little tougher, so get ready for them. Find good people and hang onto them.

What is your CattleCal top tip?

The one that popped into my head is not related to livestock or science. It's just been a book that really kind of shaped how I view a lot of different things. The first one is Good to Great by Jim Collins. That, to me, is one of those must read kind of things. Come to think of it, I need to go tell all the grad students they need to go read that. Another book, more from when I was on our on our operation thinking about investments, buying bulls, and so forth, is the book Moneyball: The Art of Winning an Unfair Game by Michael Lewis. It's a great read, but it tells the story of how people were looking at the wrong things when they were evaluating baseball players. I think we can apply some of those lessons to a lot of different things in a lot of different areas. Those are two books on my shelf that I come back to every now and then to go back through. They made an impact on how I think and how I view the world.

How can our listeners follow your work?

Website: https://extension.sdstate.edu/
Website for beef specific topics: https://extension.sdstate.edu/agriculture/livestock/beef
Email: warren.rusche@sdstate.edu

RESEARCH CALL WITH WARREN RUSCHE

Last month we spoke with Dr. Zach Smith, a professor at South Dakota State University, who mentioned a little bit about their work feeding hybrid rye to cattle. This month we spoke to Dr. Warren Rusche, an animal science professor also at South Dakota State University, more about this research.

Could you start by telling us about the project and how you came up with the idea? What were the important events that led to this research?

We were approached by KWS Cereals to see if we had any interest in evaluating hybrid rye in finishing cattle diets. Frankly when I first saw that email from Doctor Stokes suit or now Doctor Brattian, I honestly was like "Yeah, I don't know." We're in South Dakota. We grow corn. Why would we ever want to think about feeding rye? Following through I gave her a call and she started to explain some of the differences in the technology that has been developed in Europe. The fact that this hybrid rye is about 50 to 100% the yield potential of the older genetics that my family was growing in the 70's and 80's. The value it has fitting into some crop rotations. Our typical crop rotation here in eastern South Dakota and the rest of the upper Midwest is corn and soybeans. It works fairly well and we're well suited for it. We know how to grow those crops. From an agronomic standpoint it leaves some gaps. We have some issues with pests. Incorporating some other crop helps us break up some pest cycles. Rye is a lower input crop. It really does nice things from a corn yield response by including that. The more I was digging into it, the more I thought that this is a project worth taking a look at. At that point I thought this would be an interesting experiment and a nice chapter my dissertation, but I really wasn't sure if anyone was actually going to use it. It's just going to be one that's going to get done and be put on the shelf and never looked at again. I started changing my mind when a person I knew from high school stopped me at a farm exposition and wanted to know what I do about feeding rye. This was before we even started the project. At that point I started to think this project might have some legs. We started this project about two years ago in the fall of 2019 with a group of yearling steers we put on feed at the Southeast Research farm.

What did you do during the research project and what were the results?

We had 240 head of primarily Angus cross steers that came in weighing about 920 pounds that came all from one consignor at a central South Dakota sale barn. That's one of the nice things we get to do here is we can get single source groups of cattle. From a research standpoint it makes things simpler. We set the experiment up with four different treatments. Our control was our standard finishing diet that was 60% corn, 16% silage, 20% modified distillers, and 4% of the liquid supplement that had Rumensin, trace minerals, and so forth. From there we took the 60% corn and replaced 1/3, 2/3 or all of it with the hybrid rye. KWS was gracious enough to supply us the rye that we used for the experiment. It came from one farm in Minnesota, so we could reduce some of that variation.

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RESEARCH CALL WITH WARREN RUSCHE

We did test it Ergot, which can be a concern with any small grain, especially with rye. The test came back that it was within tolerance. The feed grain was a little under 400 parts per billion so that wasn't going to be an issue. Ergot alkaloids in particular. A lot of your listeners might be familiar with fescue toxicity. It's the same fungal family. It tends to infect ahead at around the time of flowering. It can be a real challenge with rye. That was one of the things that the older literature talked about. One of the reasons we thought KWS thought it was worth taking another look at is that these hybrids have traits have traits that help increase the resistance to Ergot infestation and from a review standpoint, I think most recent rye paper I can find was from about 1981. No one has done much work on that. There was some in Europe, but it wasn't North American production systems, not North American types of cattle. We thought there was value in taking another look at the feed stuff in modern diets with corn coproduct, distillers grain, in modern cattle production genetics and systems.

That was the starting point on the experimental design. We also included the rye during the step up phase because we thought it was important to examine what, if any, effect that might have as cattle adapted to feed. Honestly, my biggest concern was whether these cattle were going to eat it. We just spent about $300,000 of the university's money to feed him a feed stuff that no one has fooled with for almost 40 years. Are they going to eat it? Did we just create a gigantic mess of a bunch of cattle that won't eat, won't grade, won't gain, won't grow. They ate the feed, thankfully. On our first weigh day the high rye cattle actually gained more weight than the controls. The book value had rye at about 85% the feed value of corn on a net energy basis. That's when it started getting really interesting. The feed intakes track really closely all the way up until about day 50 of the experiment, or about 20 days after they got on full feed. From then the more rye we included they plateaued at a reduced level, and plateaued sooner. So that was one of the first things we saw. At least based on our feed records there was an effect on dry matter intake. These cattle were on feed for about 120 days. When we got out to harvest and got all the carcass data and performance results we saw a negative linear effect on including rye, where the more rye we included the cattle gained less and were less efficient. Really how the book said they would. What was interesting, though, was the one third treatment. When we only put in rye at 20% of the diet (replacing 1/3 of the corn grain), the performance measures were essentially identical to the control. When we calculated we got a small positive associated fact by feeding the rye which we thought was really, really exciting. From a science standpoint, associate effects are cool because it's kind of like I get something for nothing. Essentially it says if we feed just a little bit of rye we're getting the equivalent performance to what the corn was doing. There were no negative effects on any kind of carcass measures. The cattle graded well. No real significant changes as far as yield grade. It didn't do anything to liver abscesses. It's always the hope now that we've stumbled upon something that cures that problem. We didn't do it, but we didn't make it worse either. This project is what we presented at the national animal science meetings and also at the Plains Nutrition Council where I was fortunate enough to win first place in that contest. We published it in the Translational Journal of Animal Science.

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RESEARCH CALL WITH WARREN RUSCHE

The other questions we were left with were what, if anything, could we do to get around some of that intake response differences. We bounced around a couple different ideas. After talking with Dr. Brattain who is our contact at KWS we settled on a couple different possibilities. The first was that maybe even at low levels there was enough ergot alkaloids to depress feed intake and performance. Or maybe it was a starch from fermentability aspect. Even though the rye lower in starch than corn, it's extremely rapidly fermentable. It acts a lot like barley and wheat from that standpoint. I should've mentioned earlier that we did process thrive. We cracked it. We looked at some of the work that Dr. Penner's group has done in Saskatchewan on wheat. They found that about 78% processing index worked, so that's what we picked. We wondered what would happen if we fed it whole. We had a small group of yearling heifers for another project. We had a little bit of leftover rye, so we tried comparing our conventional diet vs one that was 100% whole rye. It was a project one graduates is first author on. When we fed whole rye they ate more. We solved the intake issue, but they also gained less. Eat more, gain less, poor feed efficiency. It was a net loss from a feeding value standpoint which highlighted issue that processing is pretty important.

Was that was it hard to process the rye? How did you process the grain and how would you recommend it be processed?

Yes, it was difficult. When we got the rye delivered, the research technician and I were going to try to figure out how to run this through the roller mill they have to crack corn. The rye went right through just like water. It was completely untouched. The operations manager knew someone that had a business making roller mills. He had made a small roller mill so his wife could make chicken feed. He loaned it to us and that worked. It would crack the rye and it did so pretty good. What we realized getting feedback from people trying this is that their roller mill simply won't do it. We're left with an opportunity feed. Most people are going to hope that it's worth more to someone else and sell it into the bakery or distiller market and buy corn if we need to. Let's cash out a higher value crop and feed rye if we have no choice. It's hard to justify buying new rollers or putting new roller mills in for something you may not be doing all that often. So the next experiment we are going to try is to go back to that 1/3 corn replacement diet that was the more ideal inclusion rate and try to feed it rolled, whole, and run through a hammer mill. Anyone who knows about feeding small grain probably cringes when they hear that. We did too just a little bit because we know that goes against recommendations on things like barley and wheat because of the particle size of something rapidly fermentable. How much are we increasing our acidosis risk? Our hypothesis is at that low inclusion level we won't create enough of a starch overload to be detrimental from a rumen health and acidosis standpoint but get a little bit better utilization than feeding it whole. We want to compare that to what we've already done and see if that becomes a more accessible processing method. There are a lot of the grinder mixers out there and small hammer mills that wouldn't be all that difficult to put back into service or bring back out to process rye. Or, for that matter, tub grinders that we're using all the time to process hay that may be an option to process rye more easily than getting a different roller mill.

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The other treatment is looking at what happens if we feed rye whole at a small level. We would expect that there would be some performance losses but are they small enough that we can tolerate those in cases where this feedstuff is cheaper. Can we still give up some efficiencies and can we lower our costs enough? It's worthwhile exploring. That's our next step in all this. Our plans are to start that in March 2022 with those cattle going to harvest in August and someone talking about that at Midwest meetings or Plains Nutrition Council in 2023.

Just to confirm, you were replacing dry rolled corn in the diets with the rye?

Yes.

You mentioned the first 56 days you had the same intake for all diets.

We were kind of controlling intake by managing a slick bunk feeding strategy, so it was only when we got out to 50 days or so that we started having more refusals and the inability to bump cattle beyond that. One other, pure anecdote thing the technician and I noticed the pens on the higher rye treatment still had feed left at 3 pm where the corn control pens were slick or close to it. We set up some game cameras to try to capture the different treatments through the course of a day. There's a person on our staff that I need to meet with to see if we can figure out a way to analyze those. It's clear from just a country boy logic that as we added more rye to the diet, we changed feeding behavior. They took longer to consume their diet. By the end of the study the steers on the high rye treatment were still cleaning up yesterday's feed when Scott had started feeding corn control diets. There's something going on. Whether it's a taste and aversion or if it's got something to do with starch and some kind of negative feedback that's affecting feed intake. There were some differences, I just can't give you all the stats to say I can prove it numerically, but just looking at it things changed.

Do you think that could be a positive effect in an adaptation phase? Could you phase feed the rye instead of just lower inclusion and then switch to a diet of whole corn?

Yeah, that might be study number four. I thought the same thing. If we get the processing deal where we have a better idea on what we can do with that, that might be something we look at. I'm thinking maybe some of these all natural programs where we're not using ionophores, could 20% rye be somewhat of an intake modifier to do some things as far as balancing feed intake. That said, it's also rapidly fermentable. Some of the data out of Poland and other places that when they've measured ruminal pH having rye in the diet causes a lower pH, so maybe there's a little bit of a tradeoff there. I can't recall what proportion of the diet that was. An area that Dr. Smith and I don't do a lot of work in is with cannulated cattle, so we might need to find a partner on that part of it. Whether we could phase feed rye and feed more rye early to use that product up then adapt those cattle over the corn and capitalize on that ability to get greater dry matter intake and greater efficiencies is something I've considered.

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RESEARCH CALL WITH WARREN RUSCHE

Who else is doing work on rye?

There's a couple other places that are looking at this. I knew Dr. Erickson's group in Nebraska has done some work with steam flaking. I haven't seen any results. I know in their first run they made some really low density, beautiful flakes, but they had some problems with feeding high levels of it with acidosis. I think with this feedstuff that handling starch fermentability is going to be an issue. Dr. Penner's group in Saskatchewan is doing a full system analysis where they planted rye and then they're going to be feeding it to the cattle. That's going to be some really cool data when they get that done. What we're seeing in our region is looking at it from a system standpoint. It's a low input crop. It breaks up some weed cycles that are pretty important. I think that's going to be it's niche. We'll know more in a couple of weeks if we can pull this off, but I think we're going to partner with some of our counterparts in North Dakota State on a growing study. That's the other part of this that we haven't looked at. Can we feed this as growing diets where we are feeding 40-50% roughage and use the rye as the sole cereal grain? That might be a niche at those kind of inclusion levels that some of the acidosis concerns might not be as much of a problem. Plus, if that's the only grain we're feeding in might make the rolling easier to accomplish.

With price and water concerns over corn and other feedstuffs, finding alternatives could be helpful, right?

When you look at the bigger picture, there are so many places where water supply is going to be an issue. I know that's a case in parts of the Ogallala aquifer. South Dakota is under drought right now and there are places in the state where they planted this hybrid rye and harvested 50-60 bushels an acre. That doesn't sound all that impressive and it's really not until you look at the corn across the road that only got 2.5 foot tall and never set an ear. In those situations the fact that we can produce that kind of grain yield on very little moisture gives us some idea from a resiliency standpoint. This crop has things to offer. It's tough. You can't hardly kill rye with a bullet. From that standpoint it's pretty easy to grow and fits into a lot of different niches. People are really gravitating toward it again. I didn't think this idea had any legs at all and I've been proven wrong. There's been some people really taking a look.

FEEDLOT RESEARCH BRIEF

Effect of a delay implant strategy on calf-fed Holstein feedlot performance and carcass characteristics

Introduction

- Holsteins typically enter the feedlot at lighter weights than typical beef breeds.
- Use of steroidal implants is among the most important management tools to improve animal performance of Holstein steers.
- This study aimed to evaluate the impact of weight of calves at first implant on growth performance and carcass characteristics of calf-fed Holstein steers.

Methods

- 96 calf-fed Holstein steers (581 ± 7 lbs) were blocked by weight and sorted into 16 pens (6 steers/pen) for a 224 day feeding trial.
- Treatments:
  1. INot implanted
  2. First implanted at 587 lbs live weight
  3. First implanted at 640 lbs live weight
  4. First implanted at 706 lbs live weight
- All cattle except cattle not initially implanted (treatment 1) were re-implanted on day 112.
- Both implants were Revalor-S (120 mg TBA and 24 mg estradiol)
- Steers were fed the same diet (table 1).
- Performance and carcass data collected.

Results

- Implanting increased DMI (5.9%), ADG (16.7%), feed efficiency (9.4%), and estimated dietary NE compared to non-implanted cattle. Implanting also increased hot carcass weight and LMA.
- Increasing live weight at first implant decreased overall DMI, but did not affect overall ADG or gain efficiency.
- Implanting between 587-706 lbs did not affect growth performance or carcass characteristics.
- Growth performance of implanted and non-implanted calf-fed Holstein steers was a predictable function of live weight (Figures 1 and 2).

Table 1. Ingredient composition of diet fed to Holstein steers calves.

Ingredient composition (%; DM basis)	
Alfalfa hay	7.64
Sudangrass hay	3.86
Steam-flaked corn	77.30
Cane molasses	4.72
Yellow grease	3.10
Limestone	1.30
Urea	0.98
Dicalcium phosphate	0.54
Trace mineral salt[a]	0.36
Magnesium oxide	0.14
Laidlomycin	0.10
Nutrient composition (DM basis)[b]	
NE (Mcal/kg)	
Maintenance	2.25
Gain	1.56
Crude protein (%)	12.58
Calcium (%)	0.82
Phosphorus (%)	0.37

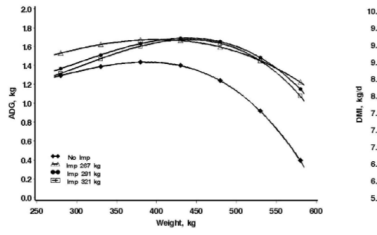

Figure 1. Performance of ADG, kg as a function of average LW, kg by treatment: (No Imp) ADG, kg = 1.7444–0.009344 AW + 0.00004213 AW^2 – 0.00000005178 AW^3, R^2 = .796; (I-267) ADG, kg = 0.7188 + 0.002536 AW + 0.000005218 AW^2 – 0.00000001394 AW3, R^2 = .895; (I-291) ADG, kg = 1.707–0.009025 AW + 0.00004094 AW^2 – 0.00000004661 AW^3, R^2 = .874; (I-321) ADG, kg = 1.952–0.01193 AW + 0.00004994 AW^2 – 0.00000005512 AW^3, R^2 = .740.

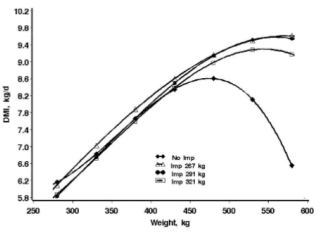

Figure 2. Performance of DMI, kg/d as a function of average LW, kg by treatment: (No Imp) DMI, kg/d = 19.925–0.13977AW + 0.000437895AW^2 – 0.000000408AW^3, R^2 = .985; (I-267) DMI, kg/d = 1.1721 + 0.01162AW + 0.000036371AW^2 – 0.000000054AW^3, R^2 = .990; (I-291) DMI, kg/d = 4.5939–0.01810AW + 0.000112629AW^2 – 0.000000115AW^3, R^2 = .993; (I-321) DMI, kg/d = 6.3112–0.03019AW + 0.000141208AW^2 – 0.000000139AW^3, R^2 = .995.

Implications

Implanting calf-fed Holstein steers had a marked improvement on growth performance and carcass characteristics. Initial implanting between a live weight of 587-706 lbs did not affect growth performance or carcass characteristics.

IMPERIAL VALLEY FEEDERS WIN NATIONAL BEEF QUALITY ASSURANCE FEEDYARD AWARD

We would like to extend congratulations to the Imperial Valley cattle feeders for receiving the National Beef Quality Assurance Feedyard Award. The collective dedication to upholding the BQA principles throughout all feedyards in the Imperial Valley was noticed on a national level.

To read more about this and other National BQA awards, visit:
https://www.bqa.org/beef-quality-assurance-awards

To watch a video highlighting Imperial Valley feeders for this award, visit:
https://youtu.be/fKZd37qEPuc

CONTACT

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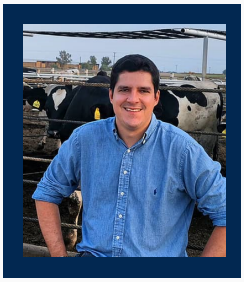

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