VOL. 2 ISSUE 7 · AUGUST 2022

CATTLECAL NEWSLETTER

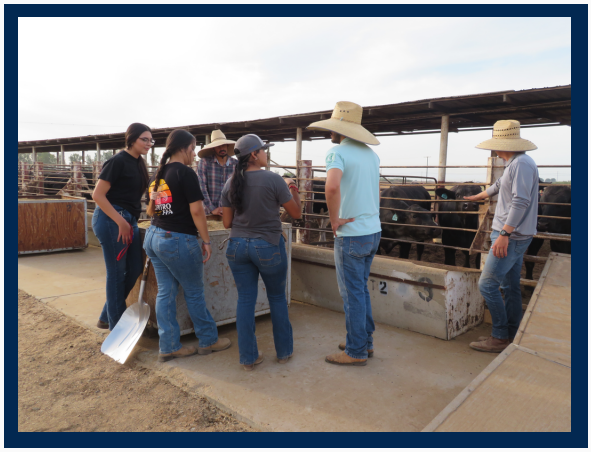
ANNOUNCEMENTS

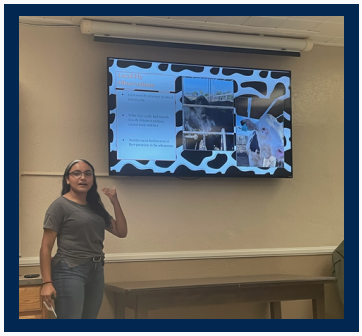
Welcome to the CattleCal newsletter for August 2022! In this issue we have exciting information on research and activities completed this month, the career and research of Jerad Jaborek, Michigan State University Extension Beef Feedlot Systems Educator, and a look at a review paper of dairy on beef crossbred cattle systems. 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.

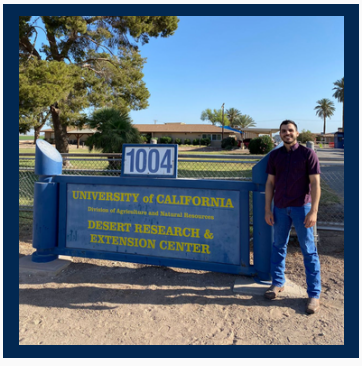
This issue:

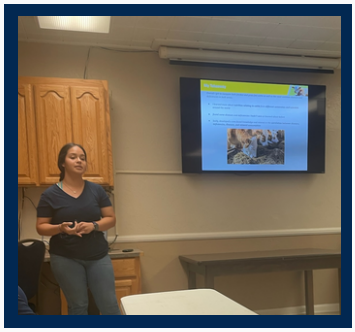
INTERN FAREWELL

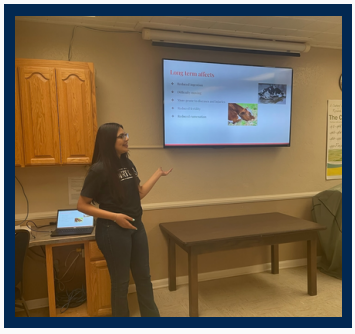
This month we sadly had to said goodbye to a group of our interns as they continue their education and career paths in animal science. Their time spent with us ranged from 3 to 6 months and their time spent here had a great impact on our program. We were thrilled to have a team of future animal scientists that were extremely hard working, dedicated, and positive members of the team. All interns presented wonderful seminars about topics important to the cattle industry that were informative and well prepared. We are extremely appreciative of all of their efforts and time spent with us and wish them well in their next endeavors!

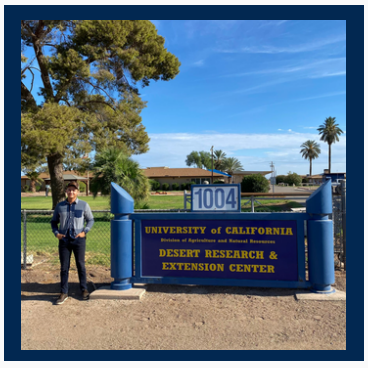












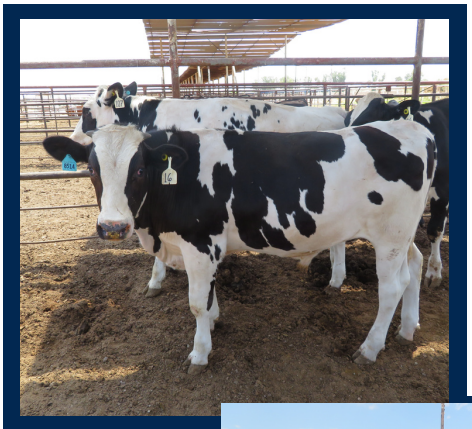
THIS MONTH IN RESEARCH

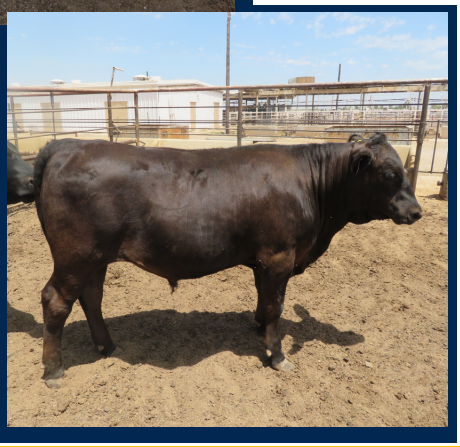
In July we continued our two projects. For July, average temperature was 91.2° F (3° F greater than June), average maximum temperature was 106.2° F (3° F greater than June), and average minimum temperature was 77.4° F (8° F greater than June).

DAYS 140-168 PERFORMANCE SUMMARY

	Holstein	Crossbred
Body weight (d 140)	782 lbs	799 lbs
Body weight (d 168)	898 lbs	918 lbs
ADG	4.14 lbs/d	4.25 lbs/d
DMI	19.8 lbs/d	18.7 lbs/d
F:G	4.79	4.39

June 2022





July 2022

CATTLECAL PODCAST AUGUST EPISODES

Career Call - CCP#065

This week Brooke Latack and Pedro Carvalho called Dr. Jerad Jaborek, Beef Feedlot Systems Educator for Michigan State University Extension. Jerad discusses his journey from working with dairy to beef, his work with a small animal processing facility, and his pursuit of his PhD studying crossbred Jersey cattle.

Research Call - CCP#066

This week Brooke Latack and Pedro Carvalho speak to Dr. Jerad Jaborek again to further discuss his research related to Jersey crossbred steers and the benefits of adding Wagyu into a crossbreeding system.

Feedlot Research Call - CCP#067

In this episode, join Pedro Carvalho and Brooke Latack as they discuss a review paper looking at beef x dairy crossbred cattle and considerations to make those cattle profitable.

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.

- Email: cattlecalucd@gmail.com
- Website: cattlecal.sf.ucdavis.edu
- Instagram: @cattlecal

CAREER CALL WITH JERAD JABOREK

This week we spoke to Dr. Jerad Jaborek about his journey through his animal science education to ultimately become a beef feedlot educator with Michigan State University Extension.

Where are you from, where do you live now, and what do you do for work?
Where am I from? That's a little bit of a long question. With the professional careers, you bounce around a little bit. I'm originally from central Wisconsin. I grew up in a small town, Vesper, near Wisconsin Rapids. From there I lived in River Falls a little bit once I went to college, which was in Wisconsin as well. From there I lived in Ohio for a little bit to do my Master's and PhD at Ohio State University. After that I got a job with Michigan State University extension and so that's where I'm currently at. I'm currently based out of the county office, Sanilac County, which is in the thumb of Michigan on the east side 30 minutes from the east shore. Like I said, I work for Michigan State University extension. I am the beef feedlot educator. I've been in this role now almost two years in September.

How did you get involved in agriculture and why did you decide to go into an animal science career?
I've been around cattle my entire life. When I was younger, my grandparents on my mom's side of the family had a dairy farm. They had Holstein cattle in a stanchion barn that they milked. I spent a lot of time with my siblings at the farm growing up when we were younger. I loved being at the farm playing, doing chores, whatever it was. When you're around that, you pick up all the information from feeding cattle, milking cows, just all that. Being around cattle, I got involved in 4H and my siblings and I started showing dairy heifers and calves. Obviously, they were smaller we could handle them. We just get attached to cattle that way. My family eventually got some Simmental beef cattle when I was also fairly young, so we had our own cattle at our own place. Eventually I switched over to showing some of our own beef cattle and showing market steers at our County Fair. It was a fairly large county fair. That was always a blast. I was always around cattle in that regard. That was a huge influence on me. As I got older through high school, I started participating in FFA. Had a lot of friends from the fair. All of that kind of tied together. I thought I wanted to do something with cattle. I really enjoyed cattle. Maybe, like a lot of young people, they don't know what some of the careers are. My initial thought was I need to go be a veterinarian. I don't want to milk cows for the rest of my life. I was hearing dairy farmers complain about the low milk prices. That they don't make enough money for how hard they work. OK, well, I don't want to do that. Veterinarians make a lot of money, right? That was going to be my plan for a little bit. Go to school and work with cattle because I enjoy the cattle and hopefully make a decent wage. Off I went to the University of Wisconsin River Falls, which was about 2.5 hours northwest of where I grew up. Almost to the Minnesota border. From there, I enrolled in animal science program with a major in animal sciences with a meat animal emphasis. I was also in the pre-vet program there as well. The pre-vet curriculum was a lot more of a science-based curriculum.

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CAREER CALL WITH JERAD JABOREK

How did you decide to switch from dairy to beef cattle? When did you decide not to go to vet school and go to grad school instead? Were you exposed to research during your undergrad?

When I get started my undergraduate education, I didn't know that I was going to go just work with beef cattle or dairy cattle or anything like that. The change came during my education at River Falls, it was toward the last two years (I think it might have been my senior year). I was already invested in becoming a veterinarian. I've been doing job shadowing to become a vet. I thought that I still maybe wanted to do that. We got a new beef production professor at River Falls Dr. Amy Radunz. She had a big influence on me. I saved some of my best classes for my senior year. I had beef production management and I had feedlot management both in my last year. That was fall semester and then spring semester before graduation. Before my senior year, I had also started participating in what was called our meat animal evaluation course, which is a combination of livestock judging and meat judging. A little different from some of the larger schools that have separate teams for each. Ours was combined. I did some of that. I really enjoyed getting to do the live animal evaluation and then do the carcass animal evaluation. It was the influence from Dr. Radunz that pushed me to change career paths. I think I actually did apply to one vet school. I think it was the University of Wisconsin, Madison. At that time, Dr. Radunz was kind of encouraging me to pursue some other alternative careers in animal sciences, particularly with beef cattle because I really enjoy beef cattle. As I was getting older in high school, I started showing cattle. I was able to train my own calves from the farm, do all that work, and steers and stuff like that with minimal help from my parents. They were busy, so it's stuff that I had to do it myself. I started getting more interested with beef cattle. My grandparents, when I just started college or maybe just before, got rid of the dairy farm. I started to become disconnected from that side. That's where I started to shift to beef. I really enjoyed the feedlot management class that Dr. Radunz taught. The summer after my senior year I decided to work with Dr. Radunz as a research assistant on a research project at the beef farm there at River Falls. We were researching different protein sources. Whether it's corn or distillers grains for beef heifers that were fed chopped hay, or something like that. Looking at different conception rates or fertility rates. Managing that project gave me a glimpse into what research is all about. While I was there, I was able to meet Dr. Francis Fluharty. I had the privilege of attending the NCC 308 group. Their annual meeting was hosted by the University of Minnesota. That's not really far from River Falls. Dr. Fluharty and Dr. Radunz invited me along, so I got to meet all the cool beef professors or feedlot professors and see what kind of research they were doing and compare that to what I'd been doing that summer. At that point I got to work with cattle every day in weighing, breeding, and feeding them. As tedious as it may be for some, that's the work that I grew up loving. That might have been the hook, line, and sinker for me. That experience right there sent me down completely different career path. From there I was looking for jobs, and I think I was considering grad school. At that time I said, “You know what? I'm not going to do vet school.” I don't think I got accepted to the one place that I applied to either. I'm not going to pursue that anymore. I'm going to look for something else. I was always interested in AI genetics. I feel like a lot of people are that work with cattle with breeding, especially people that might show like me, might think they can do it better than the next guy. I was really interested in that. I really enjoyed my reproduction class. I had Dr. Justin Luther at River Falls as my professor and I really enjoyed his class, so I thought maybe repro genetics.

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CAREER CALL WITH JERAD JABOREK

I reached out to a few professors about some potential opportunities. It didn't go where I was thinking. Dr. Radunz, meanwhile, was trying to influence me to pursue a nutrition career. At that time I was like, "I don't know." I ended up getting a job for a year at a small meat processor. A ma and pa kind of shop about half an hour from River Falls. Close enough that I could just drive down there. I worked there for about a year. While I was there we did cattle, hogs, sheep, bison, some deer in the fall, and some poultry. It was the summer after graduation because I was a research assistant for that first summer.

After working in industry for a year, what made you come back to academia?

I really enjoyed the research side of things. It's not that I didn't enjoy cutting meat. I really do enjoy cutting meat. That is a very tedious process if you're just sitting on the trim table or you're just preparing cuts. I wasn't really able to get out onto the slaughter floor, which is one thing that I really wanted to do. I wanted to also learn how to breakdown a beef carcass itself and kind of run that for them, which I never got the opportunity to do. I was breaking down swine carcasses because I could do it quick enough. That was a pretty fast paced place. At that point, it just wasn't for me. I didn't see a lot of opportunities to advance. It was a good starting job. I learned a lot, met some great people, but still in the back of my mind I was thinking of what else I could do. I had actually thought about some other industry jobs. Possibly going to be an artificial insemination technician. I got certified or trained by Genex over spring break my senior year. River Falls had a nice program where you could go learn to do that, so I was considering a job doing that. But ultimately, I stayed in contact with Dr. Francis Fluharty and he had an opportunity to do a master's project. It was kind of spur of the moment and last-minute right before classes were supposed to start. He had some funding to do some crossbred Jersey/beef on Jersey research. I jumped at the opportunity. I moved to Columbus, OH to the Ohio State main campus. I pursued a master's degree in animal sciences. That's how I switched careers. I wanted to do something different, see if that different path was going to be good for me. I knew that just at that ma and pa shop, the advancement opportunities for me weren't what I wanted.

Were you thinking of potentially doing a PhD at that time when you started your master's program?

No. I was not thinking about a PhD at that time. I was thinking I'll do a master's and that should open the door for more job opportunities at least. Wisconsin is known as a dairy state. It's not known as a leading state in beef production. What are the opportunities for me to work with beef cattle in this state? I wanted to stay close to home. What are the opportunities? They're pretty few and far between. Maybe a little bit more training might get me a position that's a little bit further up in industry that will pay a little bit better, but still allow me to stay connected to the beef industry.

How did you decide to stay for a PhD?

Well, I get to Ohio State and I'm supposed to be working with these Jersey crossbreds. Come to find out we didn't get the calves. The cows didn't get bred to produce the calves when they were supposed to. Timing was set way back. There I am already in classes. One semester done at least already. Maybe 1.5 semesters in.

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CAREER CALL WITH JERAD JABOREK

Still not doing any research. No project to work on. That's when I got the surprise that they were going to give me a sheep project. I didn't have any sheep background. I got to work with some other professors at Ohio State as part of my committee. We did a sheep feeding and meat characteristic flavor profile study. It was a big study looking at different energy sources, energy levels, different sexes of lambs, and how that affects the flavor of lamb meat. That ended up being my master's project. Meanwhile, we eventually did get the calves for the Jersey study. Around the time I finished my master's program we had one year's worth of cattle finished that we ended up raising in individual pens. We were going to do two years. In order to finish that up (what I was already committed to), I had to stay. At that point, I loved everything that I was doing. Just being able to have a question, learn how to go out there and find the answer, develop an experiment so you can figure out the answer, stuff like that is what I really like doing. I loved doing that stuff. At that point it's like, yeah, I'll stay and I'll do a PhD. I stuck around Ohio State working with Doctor Fluharty. We had these jerseys on feed that time continuing that project. We already had half of it done. Then it was time to figure out what the PhD was going to be about other than that because it was half done. It was supposed to be a master's project. You need something a little bit more for a PhD. At that point I had done a lot of reading on marbling development. It's quite influential on how we price cattle. I think that has become even more obvious since my time in school. I ended up studying marbling development in cattle for my PhD. Dr. Fluharty ended up taking a position elsewhere, so I switched professors. My major professor was Dr. Alejandro Relling. He was up at a Wooster campus. We had a lot of video conversations about research with these guys.

It's not too uncommon for major professors to move to positions at other institutions or for changes in research projects, right?

In research you have to prepare for the worst. Anything can go wrong, so be prepared for it because it could happen. You learn the troubleshoot and work around problems to come up with solutions. How are you going to get around this? How can you still get your work done? There's a lot of life lessons that you learn from being a graduate student. You still have to dedicate your time to your study. Just always learn. If you don't like learning, it's probably not for you. That's what it's all about. It's about going out there and figuring out the answers to questions. It was a great opportunity.

Can you tell us about your current position in extension and how graduate school and your background prepared you for working with clientele?

Grad school prepares you for the academic side very well. Along the way, for some programs, you're required to do some teaching. You required to be in that classroom. You've been in a classroom for so long you. You gave presentations. You know what teaching is like. Part of it is doing scientific presentations or interacting at scientific conferences. You go present your research and tell other people what you learned. That's partially what extension really is. We are sharing information with other people, so in that regard grad school helps prepare you. The research side, like I said, you've been doing that through grad school and you understand what that is. The extension part is working with a different group of people than what you've been used to.

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CAREER CALL WITH JERAD JABOREK

Growing up in that agricultural background really helped me. It really wasn't any different for me in the sense that I get along great with all of these people. A good day for me is when I get to go out on a farm and help someone. We do some troubleshooting, or we're talking about changing up diets or something like that, or what they could do different to help better their operation. Those are good days for me. Those are good conversations. Communicating with other beef producers came naturally. It is an enjoyment for me. There are other opportunities potentially out there. Dr. Fluharty had a 100% research appointment, yet he still taught classes at Ohio State. He did a lot of extension and was on the road all the time helping other beef producers out there on their operations and giving extension talks. I have seen them in action. When you're a student, it's not like you're doing that unless you've been given the opportunity. I wish looking back I could have taken advantage of those opportunities if they were there. Taking advantage of programs that are put on at the University. Helping out. We did a Beef 509 course. We brought in beef producers. Talked about procuring cattle, how much you beef you get back once you buy it, go through the cutting process, the fabrication process, just talking about beef in general and educating those producers. I was able to be involved with stuff like that. Those experiences are very helpful for someone that is thinking about possibly going into extension.

Does a lot of your daily work include going out and doing farm visits and having those conversations?

I wish it was a daily occurrence that I was on farms. Maybe in the future will be. Currently, not as much as I'd like. The producers that I work with, for many of them, this has been their career. They grew up doing this or they've been doing this for a number of years. At this point they have enough experience or knowledge. That's got them so far where they've been so successful. Until they have a problem, they don't necessarily reach out. Sometimes they come to programming events that I put together for presentations and they can learn something new. We have conversations there. They ask questions, we answer them. Everyone is able to talk in the audience and kind of bounce ideas off of each other. There's other resources out there or they've been doing it for so long they don't necessarily reach out all the time. Sometimes there's quiet periods. During those quiet periods it's not like you can't find stuff to do. You're always preparing for the next program. You're always writing the next article that can provide them a little bit of knowledge. Maybe I want to process my corn. Maybe I want to feed a different percentage of corn in my ration. There are so many things that some people fail to consider.

You probably have paperwork to keep you busy, as well, right?

Yeah, that's my least favorite part of all. The administrative work, trainings, and paperwork. The other parts of my job like nutritional consulting, building diets, writing those articles to help people, fielding those calls, when you're asked to come out and take a look at operations and offer them advice. That's the fun part.

How important were mentors through your education and career and how do you recommend people to search out those mentors?

I think those mentors are extremely important. I could probably even rattle off other people that have been extremely influential. You find people that you really enjoy learning from that you can have a relationship with.

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CAREER CALL WITH JERAD JABOREK

You can go to them and ask questions and continue to learn. They're willing to help you. That's really important. Life is about the people that you know. They open opportunities for you. It's a networking opportunity where you get to meet new people. They provide you with new opportunities. That ultimately gives you different options, different road paths that you can go down. I look back now and if I would have done some internships (I spent all my summers trying to make money to pay for college) and maybe had been willing to branch out travel a little bit more, I might be doing something different. Maybe working somewhere different. I think those networking relationships that you make can point you in so many different directions. Even in grad school, going to scientific meetings and meeting different professors, meeting other grants students. It's great being able to make new friends that you'll have the rest of your life and you'll be able to call up and you can ask questions. We never know what opportunities might present themselves.

What is your favorite food?

That's a tough question. I really like steak, and maybe that's a very generic answer that a lot of people give. I am picky when it comes to steak. I can probably picture my favorite steaks still to this day. One of them was at a steakhouse when I went to that first NCC 308 meeting. It had to be somewhere in the Twin Cities. I remember your old PhD advisor, Dr. Tara Felix, giving me a hard time about how fast I ate mine. I remember that was my best steak for the longest time until I tried Wagyu steaks from my PhD project. Very good. We cooked a number of them. They were very good. There was a period where if you do any kind of shear force or sensory work, you would eat it. I did a bunch of sensory work for lamb, and then we did some shear force work with some of the cattle work that I did. You get a little tired of that smell after you cook steaks for so long. They're still really good. I had the opportunity to be a teaching assistant for barbecue science class with Dr. Mike Cressman at Ohio State. That's really fun when you can learn all these little techniques on how to grill a little bit better. Also learning about sous vide was really neat. There was actually a grad student that was doing a project on that the time when I was at Ohio State, so I had to go get one for myself and that has changed the State cooking game.

What do you like to listen to?

I grew up listening to country, so 90's country is my favorite. I think once I got to college, I started listening to a little bit more rock. It'll either be rock or country at this point. It's funny how a song can bring back really good memories.

What is something you know now that you would go back and tell your younger self?

I mentioned a few already. I wish I would have done internships. Maybe branched out and done a PhD somewhere else. Stuff like that. One thing that I think has dictated a little bit of where I'm at is the pandemic. When COVID broke out I had just finished my PhD and was looking for jobs. I don't think I can remember how many jobs that said they were going on a hiring freeze. All of the opportunities that were lost to me. This position happened to be one that still stuck around. Sometimes it's timing. Sometimes you get lucky, sometimes you don't. If I would've known that was going to happen, maybe I would've had a job lined up well in advance.

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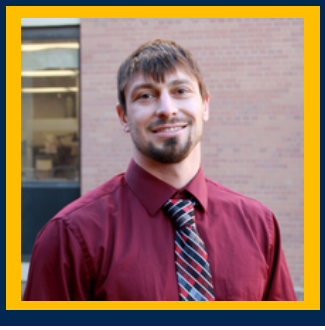
CAREER CALL WITH JERAD JABOREK

Maybe I shouldn't have procrastinated so long. Should have figured out that job a little bit sooner. For those grad students out there, find a job sooner than later.

What do you see next for the beef industry?
We're being brought into the beef on dairy world. That is a hot topic now here the last couple years and probably will be for a little bit. I think that will present a lot of research and educational opportunities, so there's definitely going to be some work on that. It's hard to say what the next fad might be or what kind of turns we might take. The evolution of the beef industry is small changes and who knows what kind of technology might be developed that's going to help us improve efficiency down the road. I wouldn't be surprised if there's something like that.

What is your CattleCal top tip?
I'm going to change it up a little bit. I don't do much reading outside of research papers. There are so many research papers out there. Find one that you like to read or is something that you need to read. There's always stuff out there to learn, so don't stop doing that. I don't watch much TV or movies or anything anymore besides occasional YouTube video, but I think my recommendation is to get outside. Do a little fishing if you like the outdoors. I like going to the gym. Get moving. We spend enough time staring at the computer.

How can people follow your work?
Website: https://www.canr.msu.edu/people/jerad-jaborek
Email: jaborekj@msu.edu



RESEARCH CALL WITH JERAD JABOREK

This week we speak to Dr. Jerad Jaborek about his research with beef on dairy and Wagyu crossbred cattle and their impact on performance and carcass characteristics.

Could you just tell us a little bit about some of the research you've done just looking at beef on dairy crossbred cattle?

For my master's/PhD project, when I start grad school, one of the first projects I had was put on was investigating how a beef on dairy cross breeding scheme would work. In that instance it was with Jersey cattle. One of the problems in the industry was that Jersey bull calves have little to no value. I had producers telling me that they got a nickel sent \ in an envelope for a bull calf that she sent to the sale. It was an issue in the industry of what to do with these calves. We didn't want it to become a welfare issue. Looking at different opportunities of how we can add value to these calves, one of the ideas was to crossbreed them with beef sires. We investigated breeding with four different breeds. We bred them to either purebred Jerseys as our control, Black Angus, SimAngus, and Red Wagyu. We had a couple different breeds that we were looking at. We were looking at how these breeds crossed with Jersey. We did two batches of calves. We ran them through the feedlot on a corn silage-based finishing diet with a whole shell corn. One summer we did have to switch over to some soy hulls because we ran out of corn silage. For the most part that was the diet we were feeding those cattle on slats. We harvested them at our university meat laboratory and we did a full cut out on those cattle to look at the actual yield coming from those cattle as far as how much boneless retail cuts we were getting back, how much fat are we getting back, and how much bone is this carcass actually producing. That was very interesting to see what the percentages were and how that was different with different breeds of cattle.

One of the most notable findings that maybe some people knew back in the day from some older research was that Jersey can carry a lot of internal fat. A lot of kidney fat. We were able to do a full carcass evaluation/fabrication on those cattle. We also did some fatty acid analysis to look at whether there are some different health or potential health claims that people could be making. We did some tenderness evaluation, as well. Through that study we were able to see that crossbreeding improved feedlot performance with the beef sires. For the most part, the majority of them were selected to deposit marbling rather than to promote growth. We were trying to target more of a value added or niche market claim for those cattle. We did see an improvement in average daily gain, and efficiency as well for some of those sires. We actually reduced the number of days on feed that the crosses needed relative to the purebred Jerseys, which we know is going to cut our costs as far as how much feed they're needing in total and yardage. When it came to carcass characteristics, we were able to add more muscle, but maybe not where you might be thinking. When we measured the rib eye area just as a normal split carcass, we saw that there wasn't a difference between purebreds and crossbred cattle. When we did the fabrication, we saw SimAngus and the Red Wagyu, they carried more muscle in the chuck and the round.

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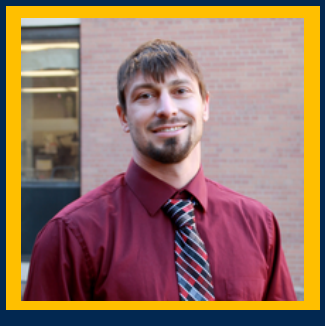

RESEARCH CALL WITH JERAD JABOREK

They added a lot more retail yield compared to the purebred Jerseys. We were able to add value in that way. We evaluated whether we sold the cattle on a live basis, a grid basis, or through retail. It is very interesting to see that if you raise all those cattle to the same live weight, the price you are going to get is not really different except maybe you have dairy discount on the purebred Jerseys. On the grid we saw that we actually had improved marbling from our crossbred cattle. The beef sire cattle had better marbling. We achieved low prime for an average marbling score for our Angus sired cattle. The red Wagyu (also known as Akaushi) and SimAngus sire crosses were high choice. Our Jerseys on average were just average choice. For those that don't know, dairy cattle can deposit some pretty good marbling. Holsteins and jerseys in particular. Average choice is pretty good for these cattle as an average. We saw that we actually improved it with crossbreeding with beef sires, so that was quite interesting. We had a greater value on the grid for our beef crossbred cattle compared to our purebred Jerseys anyway. Again, we're seeing that we're adding value.

One of the biggest shockers was how much product we got back in the end. We saw that the yield rate equation doesn't necessarily estimate retail yield as well as some like to believe, particularly with Jerseys. We saw that the value of those cattle actually will decrease for some retail product just because there wasn't as much retail product there. Those cattle that carried a little bit more muscle, like the SimAngus and Red Wagyu, had that quality grade premium but they also carried more muscle more meat in the end. We were able to see a little bit more value compared to our purebreds as well. In the end, we're actually improving the value of those animals. We saw that the SimAngus and Red Wagyu were more tender than Angus sired and Jersey cattle. Tenderness was improved through 14 days of postmortem aging. They wet aged steaks until 28 days. There was a little bit of a decrease to about 21, but it wasn't significant. Up to 14 days, if people are thinking about aging their beef is a pretty good time. There are differences in the fatty acid profile for those cattle as well. Maybe that's one reason that people actually seek out Wagyu, for instance. As you deposit more marbling, you're depositing more fat within that muscle. That fat composition starts to shift as well. We start to get mono-unsaturated fatty acids compared to the saturated fatty acids. Mono-unsaturated fatty acids have one double bond in them, and they're actually found to be healthier compared to saturated fatty acids.

When you mentioned that crossbred cattle had increased tenderness, was the baseline for the purebred Jerseys already considered tender?

Yes. Relative to USDA standards on what they need for a labeling claim to be considered tender, they were all under that. They were actually all under "very tender" after seven days of postmortem aging. We left those carcasses hanging in the cooler for seven days before we fabricated them. They were very tender at that point. Jerseys are able to deposit some marbling. They're very tender. If you ask a lot of people, they will tell you that they have excellent flavor profile as well. That might be partially due to their fatty acid composition as well. We saved some of those steaks that were aged 28 days. You could nearly cut him with a fork.

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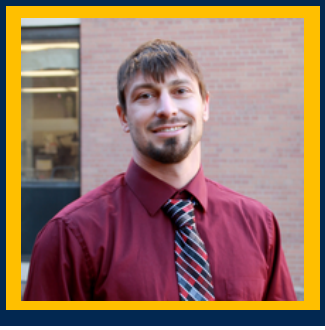

RESEARCH CALL WITH JERAD JABOREK

Could you go more into detail about crossing cattle with Wagyu and what that does to meat quality, especially with marbling?

It varies a little bit and is going to depend on the few factors. For the jersey crossbreeding experiment, we used Red Wagyu. That's very different than the Black Wagyu. The Red Wagyu are known to carry a little bit more muscle relative to the Black Wagyu, but they don't deposit nearly as much marbling as the Black Wagyu. In Japan they have a couple different breeds, if you will, of Wagyu. Black Wagyu, Red Wagyu, a Shorthorn variety, etc. They're raised in different regions or prefectures over there, so they've been selected for differences in genetics. The Japanese Black Wagyu, for instance, has been selected really strongly for marbling ability. There are some prefectures that are more extreme than others. For instance, the Kobe prefecture. A lot of people have probably heard of Kobe beef. Technically, Kobe beef is only beef raised in the Kobe Prefecture. There are drastic differences in the genetic potential between what actually gets classified as Wagyu. I may be a little rusty on it, but if you look up the classifications of what qualifies for Wagyu in the United States, it has to be around 47 or 49% from the American Wagyu association requirements. Genetics can vary considerably between those cattle. The Red Wagyu perform quite well. It improved marbling when we crossed them with the jerseys. They actually added more muscle relative to the Angus and more or similar to our SimAngus treatment. You have to take some of that with a grain of salt because we only have so many sires within each breed. Is it representative? It's hard to say sometimes. Sometimes they carry a different fatty acid profile, more polyunsaturated fatty acids. Those are really beneficial as well. It makes a fat a little bit softer.

Another one of my projects for my PhD was looking at marbling development. We used Black Wagyu to crossbreed with our university cattle, which are a SimAngus based herd. We actually investigated marbling there, and those cattle marbled extremely well. We had two different Wagyu sires and we saw differences between both of the Japanese Black Wagyu sires. There are differences in marbling potential within the Wagyu breed that can be quite extreme. For instance, when we harvested those cattle, for our high marbling Wagyu we had low primes on average and then it was only high choice for what we called our high growth Wagyu sire. There are differences just within the Black Wagyu breed just based on sire. Just like any of the other breeds, you have to pay attention to what their genetic potential is. Look at EPDs.

When I have that conversation, people will ask what breed they should crossbreed with. For example, the beef on dairy, what breed is best? Everyone has their opinion, and I don't want to take sides. However, you have to be able to compliment your system. It ultimately depends on which what you're trying to produce. There are some bulls that excel in certain traits versus others within their own breed. It's selecting the bull for the traits that you want and not just one trait in particular. You want to have a well-rounded bull, but make sure that they excel in the things that are important. For instance, we need to add muscle to those dairy animals. We want to add some growth. We don't want to sacrifice the marbling. We're selecting for bulls that excel in growth traits. Maybe considering calving ease as well. We need to have live calve so we aren't going to have dystocia issues on those dairies. For a lot of breeds, they have an indicator for muscling ability in ribeye area. Marbling ability, as well. Select bulls that are in the top percent for those traits that compliment the dairy animal.

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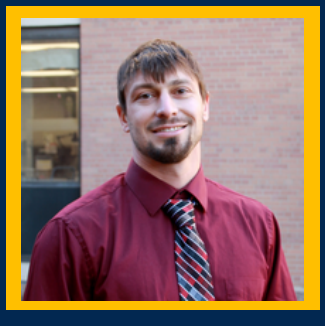

RESEARCH CALL WITH JERAD JABOREK

What is affecting marbling? Is it genetics, nutrition, age, etc?

There are a lot of factors, whether it's age, nutrition, time, and genetics. All of those play a role. In this study we looked at different genetics. We had Angus sires versus two different Wagyu sires, one that was selected more for growth and the other was selected for marbling. We saw differences in performance where the high growth Wagyu was able to almost keep up with the Angus with no difference. These were high marbling Angus that we selected for. While the high marbling Wagyu didn't grow as fast, they were able to deposit more marbling at a smaller size. We actually harvested those cattle in two end points. One was a similar days on feed. Because the high marbling Wagyu grew slower, they were much smaller compared to the heavier Angus or the high growth Wagyu. Even at a smaller final weight they had more marbling. When we allowed them all to reach the same final weight, they had much more marbling because they were allowed to have that extra time eating more calories to put on more fat. There's definitely some influence from all those factors. We looked at a couple different. genes, I believe about 40 different genes, that we know are associated with fat development. In the development of fat, you have these progenitor cells that are deciding what they will grow into. We wanted to measure genes that would become intramuscular fat cells to give us marbling in our steaks. We looked at genes that represent division. When the animals developing, these cells are all replicating. It has a bunch of them that can grow to eventually be a fat cell. Then we look for genes that make things become a fat cell. We tracked these different genes. We looked at other genes that are associated with fatty acid synthesis. In fat we have fatty acids, which are particular chemical structures that need to be built. We looked at the genes that are associated with that. You have to put those fatty acids together to make a triglyceride. Fat cells are filled with triglycerides. We looked at different transporters and all of the genes that are needed for that makeup. They actually looked at some that break them down as well. We biopsied these cattle five different times as they were growing from weaning until finishing or until we slaughtered them. From seven months until whenever we slaughtered them, which ranged from 14 months to 19 months. We saw similar patterns in the development of marbling. One thing that we did see is that the master regulator, the one gene that kind of regulates all of fat development, started a little bit sooner for our high marbling Wagyu. There are a couple other genes that had some interesting differences. We're actually going to try to develop another study hopefully in the near future that will get started to answer some more questions. We saw that the up regulation of our master regulator occurred shortly around the time that these cattle started their finishing ration. We had them on a growing diet for about four months. A lot of corn silage.The diet was about 55% corn silage. They were on a growing ration before we switched them over to their finishing ration. Once we did that, they really started depositing the marbling based on what the gene expression would tell us. We didn't do any serial slaughter to confirm this, but based on the genetic expression, we would assume that. There are differences there. It's very subtle at this point from what we saw, because like I said, the pattern seems very similar in many cases. It seems like those high marbling Wagyu started just a little bit sooner, and there may be some other genes in the background that may help or may have caused this. We're hoping to have another study here in the near future to confirm some of this. We're thinking about raising some of these cattle up to older ages because over in Japan it's typical for them to raise their Wagyu cattle to 27 or 30 months of age.

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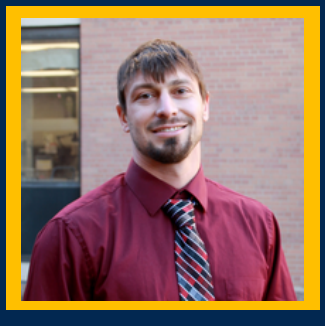

RESEARCH CALL WITH JERAD JABOREK

In the US, our production systems are so different that we're able to finish cattle anywhere from 12 to 16 months of age. For example, in this study that we've been discussing, cattle were only 14-19 months at the oldest. There's a lot of potential there that we weren't able to unlock yet. We're curious how much it changes as we allow these cattle to stand and feed a little bit longer and achieve a greater age. Try to set up some different treatments up there. It will be exciting to see what else we can learn.

Could you discuss a little bit of the difficulties you had doing the crossbred and Wagyu studies?
There are always challenges. Sometimes cattle go off feed, for instance. You guys might experience that with the heat. I know. One of the years when we were feeding the Jerseys, we had a number of the purebred Jerseys that wanted to go off feed on us a little bit. That was a bit of a challenge. Trying to get their intake back up and keep them growing was a challenge for us. We raised those cattle in a research setting, so sometimes how long they are on feed can be a challenge. They are on concrete for a while, so there's obviously challenges with that. You want to take the best care of those cattle. Getting them to their final endpoint can be tough sometimes. Sometimes cattle do stupid stuff. I don't know if it's a dairy thing. They do some funny stuff.

Have you seen in your work that Holsteins tend to have more mechanical issues than crossbred steers?
I wouldn't say that I really noticed a difference. I think the purebreds are obviously a little bit frailer in structure. It's obviously important to consider the sire as well in those crossbreeding decisions. That you're selecting a bull that has proper feet and leg structure as well. We're looking at crossbreeding some beef bulls with Holstein cows here at Michigan State. We are actually wrapping it up. I really wouldn't say that we noticed a difference in locomotion. These guys are right near the end for slaughter. That's a good question that needs to be addressed, maybe with some research. Where I'm at, we have a lot of producers that feed cattle in confinement. There are a number of people that feed cattle on slats. With Holsteins, they just require a longer period of time on feed just because the management structure. They're raised from calves. That offers a lot of stress on those joints, for instance, which can lead to problems down the road. We are raising cattle to heavier weights all the time. We really don't have great numbers on some of these Holsteins that are achieving 1500 pounds. Do they need more space? Are they stepping on each other? We don't have some of that information. I think that trickles over into some other crossbreeding as well. Part of that is management depending on how those cattle are grown. Are they on a high energy diet? Are they calf-feds or are they yearlings that were on a lower energy diet? Maybe pasture before that allowed them to grow such a large frame that they have to be 1500-1700 pounds before they're finished. There are questions out there that we don't have the answers to.

FEEDLOT RESEARCH BRIEF

A review of beef on dairy crossbred cattle

Economics

- Using beef semen has provided an opportunity to increase the value of dairy bull calves.
- Several international models have shown an increase in profit when included beef semen along with sexed and conventional dairy semen in their breeding program.
- Profitability of beef x dairy crossbred cattle is dependant on price of heifers and price of crossbred calves.
  - High heifer prices have been shown to cause a net loss for dairies working with beef semen.

Current Beef Semen Use

- In the US from 2016-2019, 95% of beef semen used for beef x dairy crosses was Angus.
  - Second most common was Charolais (<1%)
- In California, the top three beef semen breeds used for crosses are Angus, Charolais, and Wagyu.
- The number of Western US dairy herds using beef semen for a portion of their herd increased from 33% (2010-2017) to 77% (2020).
- Use of beef semen is predominantly found in herds with poor conception rate or cows on their 3rd or greater parity.

Selection and management

- Beef x dairy selection indices in the US are not as developed as other parts of the world.
- Some existing indices look at:
  - Calving ease
  - Feed intake
  - Carcass characteristics
  - Yearlings - may cause discounts
- Current US bull EPDs for beef x dairy progeny are based on data from beef breed progeny.
- Good management of calves is critical.
  - Calves may not be able to express beneficial genetic health advantages under poor management.
  - Bull calf care is typically not prioritized compared to heifer care.

Conclusion

To maintain the value of beef x dairy crosses, sire selection must include critical genetic criteria and calves must be managed well to maintain market viability.

Considerations For Selecting a Beef Bull To Cross With Dairy

- Coat color - may get premium for black coat
- Polledness
- Calf mortality and health
- Calf size
- Growth performance
- Carcass characteristics to minimize discounts
- Frame size

Growth Performance

- Current data are variable, older, and/or not relevant to US systems.
- Sire may affect ADG, DMI, and feed efficiency.
- Beef x dairy crossbred cattle have been seen to improve ADG and feed efficiency.

Carcass Characteristics

- Crosses appear to have an advantage over purebred dairy cattle in carcass weight and dressing percentage.
- Dressing percentage for beef x dairy crosses was still less than purebred beef breeds.
- Ribeye area
  - Continental breeds have been shown to sire progeny with greater ribeye area compared to purebred dairy.
  - British breeds have been shown to sire progeny with less or the same ribeye area compared to purebred dairy.
- There is less variation in back fat thickness between crosses and purebred dairy than other carcass traits.
- Marbling and tenderness
  - Some studies have found an improvement for both qualities depending on breed of sire and the specific sire within that breed.
  - Crossbred dairy cattle should meet the standards of the consumers.

Frame Size

- Holsteins are longer and taller, affecting dressing percentage.
- Beef x dairy crosses may still have longer frames, which could be an issue with packing plants.
- Taking yearling height into account when picking bulls might help with this issue.

CONTACT

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.

- Email: cattlecalucd@gmail.com
- Website: cattlecal.sf.ucdavis.edu
- Instagram: @cattlecal

Creator contact:

Dr. Pedro Carvalho, Assistant CE Specialist in Feedlot Management at UC Davis

- Email: pcarvalho@ucdavis.edu

Brooke Latack, UCCE Livestock Advisor - Imperial, Riverside, and San Bernardino Counties

- Email: bclatack@ucanr.edu

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