VOL. 2 ISSUE 10 · NOVEMBER 2022

CATTLECAL NEWSLETTER

ANNOUNCEMENTS

Welcome to the CattleCal newsletter for November 2022! In this issue we have exciting information on research and activities completed this month, the career and research of Dan Macon, UCCE Livestock and Natural Resources advisor and county director, and a look at a research paper on carcass characteristics of beef x dairy crossbred cattle. 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:

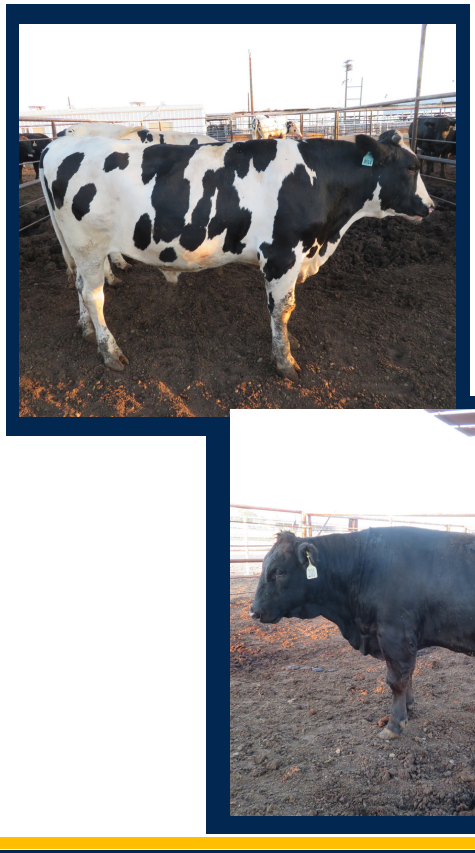
THIS MONTH IN RESEARCH

In October we continued our two projects. ADG and feed efficiency improved quite a bit compared to September. In October, average temperature was 75.7° F (12° F less than September), average maximum temperature was 90.1° F (10° F less than September), and average minimum temperature was 62.6° F (13° F less than September).

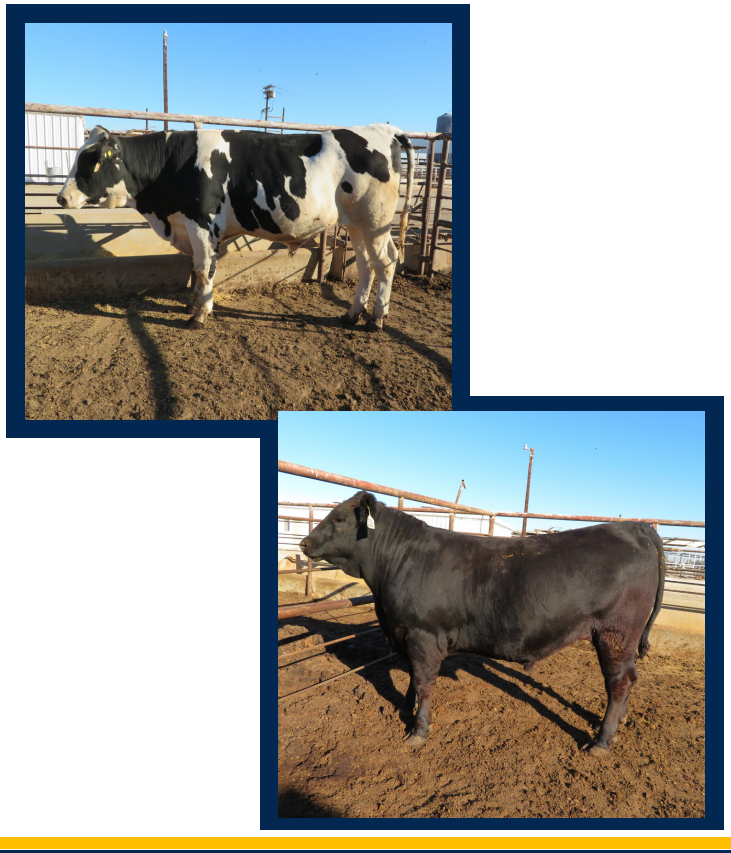
DAYS 252-280 PERFORMANCE SUMMARY

	Holstein	Crossbred
Body weight (d 252)	1128 lbs	1128 lbs
Body weight (d 280)	1224 lbs	1236 lbs
ADG	3.42 lbs/d	3.84 lbs/d
DMI	21.3 lbs/d	20.6 lbs/d
F:G	6.22	5.37

September 2022



October 2022



CATTLECAL PODCAST NOVEMBER EPISODES

Career Call - CCP#076

This week Brooke Latack and Pedro Carvalho called Dan Macon to discuss his background in agriculture economics, work in the livestock industry, and ultimately how he ended up doing research and extension for the University of California.

Research Call - CCP#077

This week Brooke Latack and Pedro Carvalho speak to Dan Macon again to discuss his work looking at guardian dogs and their interactions with livestock and wildlife.

Feedlot Research Call - CCP#078

In this episode, join Pedro Carvalho and Brooke Latack as they discuss a review paper covering carcass characteristics of beef x dairy crossbred cattle.

Quiz Zinn - CCP#079

In this episode, we asked Dr. Richard Zinn about feed management during hot summer months.

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

QUIZ ZINN

Are there any feed management strategies or feed formulations that would help with the heat in the summer for cattle?

Thermoregulation of cattle

This is a very important question for every sector of the feedlot cattle industry all over the world. This is going to always be an issue. Before I can answer the question, I need to back up just a little bit. One of the problems that we have is that we use the word heat stress. This creates a lot of confusion. The hypothalamus of the ruminant is trying to control the temperature at a set point between 100.5 and 101.5° F. What's going to happen is as the animal's blood temperature perfuses the hypothalamus, then it's going to make some automatic adjustments so that the animal can stay within that set point. Really what we have is conditions of hypothermia or hyperthermia depending on the situation. In this case, we're going to talk about hyperthermia. During conditions of hyperthermia, the animal is going to automatically make a bunch of adjustments to various things. Some of the types of adjustments the animal is going to make are very rapid adjustments. These would be changes in respiration rate, changes in sweating, and search for cover. Some adjustments that are slower will be a reduction in feed intake and a change in hair coat. We have some very quick adaptations and some longer-term adaptations that are going to be happening automatically. The animal really isn't thinking about this. This is just going to happen.

Methods to aid in heat abatement

When we think about what we can do to help the animal as it tries to adjust, we can think about four different areas that are going to work together on the problem. One of them is shelter and shade. Another one is going to be animal management. A third area is going to be feeding management, which we're going to talk about a little bit. Finally, we can think about diet formulation. All of these things are going to be important as we anticipate the animal's efforts to adapt to the conditions of hyperthermia. What we have to understand is that the animal can actually withstand an elevation in body temperature without changing the set point. The body temperature will just rise and rise. The rise in body temperature itself isn't a problem until it gets to around 104 to 104.5° F.

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When it gets to that, the animal could be in a difficult situation. In a normal feeding period, the body temperature may actually normally go above that, but it would only be for an hour or a very short period of time, and then it would come back down again. You could see that there will be a cycle through this. This is more normal and not something that would be life threatening or difficult for the animal. However, some animals have great difficulty in making all these accommodations. There are a lot of other background problems that cause the animal have difficulty. You want to be careful that the animal core temperature doesn't get to that 104 to 104.5° F number for a prolonged period of time. Then we have to consider various management aspects. One of them, of course, is shade. When an animal has access to adequate shade and space, then they're able to deal with the temperature a lot better. The other thing, of course, is animal management. Just moving that animal, the exercise and moving and excitement and everything associated with it, will raise the body temperature 1-3° F. For example, at the research center, we do not handle cattle if the temperature humidity index is above 80. This can happen early in the morning. It doesn't have to be when the sun is out. Being very careful about that is especially important. Nowadays we know a little bit about the weather, so we can anticipate the weather much better than in previous years. It should be no surprise to a feedlot that there's going to be a serious event in terms of temperature-humidity indexes. They anticipate that with maybe four days in advance. It's very unfortunate if animal management doesn't take that into consideration. This is especially important in receiving cattle. If you're buying cattle and you know the temperature is going to be extremely high when these cattle come in, then you should delay the shipment of those cattle. There are just some things we can do that are very logical, but oftentimes we just go forward and some of the cattle are going to be hurt by that process.

Feeding management in the summer

One of the things that really can affect feeding management is when we handle cattle, like moving them to the chute for an implant, they're going to lose part of a feeding. What happens is when they come back they're going to eat a lot of feed. Many of the cattle can be very susceptible to that temperature and getting too hot, so they succumb to the problem.

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The other thing with feeding management is that you want to make sure that the cattle always have feed during that high heat period because you don't want cattle to be hungry and then all of a sudden eat a bunch of feed. As you anticipate coming into the period of high heat you do not want cattle to be out of feed. This is a difficult task for large feedlots where you have everything going on alright.

Summer diet formulation

When the animal's temperature gets to 104 to 104.5° F for a prolonged period of time, the animal is going to start shunting the blood to the periphera in an effort to dissipate the body heat. What this does is this elevates the core temperature, especially around the digestive tract and creates leakage in the intestine, especially in the distal ileum. All along the ileum, but especially the distal end. The ileum membrane is very thin. We have a potential for leakage in that area. What happens is if substrate down there in the lower digestive tract, which would be normal, if you have leakage then you're going to have these lipopolysaccharides that are going to move into the bloodstream and you're going to have endotoxic shock. That's what kills the animal. The animal is literally dying of shock. What we can do in terms of diet formulation to protect against that is to add more forage to the diet. What this does is it just protects the animal a little bit from this acidosis. Having said that, what we need to understand is that by adding more forage to the diet, that alone does not lower the body temperature. In fact, we've conducted a couple of studies where we looked at forage level both in crossbred cattle and Holstein cattle and core temperature is higher with the higher forage level. It isn't a way of alleviating heat load so much as it protects the animal against the problem. Carbohydrates reaching the small intestine are highly fermentable, so it gives that effect. When you feed a diet that's 18-20% forage, average daily gain is actually improved. Years ago, Lofgren did some work here at the center also looking at this and found that lower energy diets (these are steam-flaked, corn-based diets, so still 2.15 Mcals NEm high energy diet) by adding more forage is beneficial during these critical periods. We should understand that it does not reduce the core temperature. It reduces the threat of coliform development in the lower digestive tract. It's hard for feedlots to feed those higher forage levels because it bulks up the diet, makes for feed delivery issues, and creates issues in forage processing and integration in the diet at the feed mill. With that said, if you can feed an 18% forage diet, your cattle will do better regardless of when and where you are.

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If we see that there is a heat wave coming next week, what are the management strategies we can take to prepare?

The biggest mistakes feedlots make are the things I already mentioned, which will just compound if there are issues. One option to help is to step back one diet. A lot of feedlots will do that and back one diet up. That's sometimes difficult, especially when you have a two or three diet program. Backing up a diet especially works on a four-diet program which is what I would recommend. The other thing is to not work the cattle. If you have a problem just leave those cattle in the pen. It doesn't matter how important it seems to do, do not work the cattle. That will be especially beneficial. Feeding the majority of the feed in the morning will definitely be beneficial. You have to adapt cattle to that as well. It's not something you can suddenly start doing. If you are in an area where you suspect this, go to a 30:70 program. Feed 30% in the morning and 70% in the evening. That will be beneficial. Do not let those cattle get hungry. Keep feed in front of them. If it's a slick bunk management program, do not let those bunks go slick during the high heat period.

What do I do if we are in a heat wave and the cattle have decreased intake but I know the weather will get nicer soon?

This is a very real problem. Not so much here because the weather doesn't get nicer. It stays hot. In areas like the High Plains, Texas, Kansas, Nebraska, Iowa this is a real problem because it can be very nice weather, get extremely hot, and then in a few days it is back to being nice. The most important thing I would suggest in these conditions is to never allow feed intake to increase more than 5% per day. Never let that happen. Even though a feedlot management plan says that is never supposed to happen, it does happen. You want to talk to your personnel and stress the importance of this not happening during these high heat periods.

CAREER CALL WITH DAN MACON

This week we speak to Dan Macon, UCCE Livestock and Natural Resources Advisor for Placer, Nevada, Sutter, and Yuba Counties, and County Director for Placer and Nevada Counties, about his background in agriculture economics, industry work, and work as an advisor.

Where are you from and what do you do?
I was born in in Southern California, but my family moved to the Sierra Foothills when I was four months old. I grew up in Sonora, which is in the gold country, just north of Yosemite. I was there until I graduated high school and then went to Davis. My wife and I have lived in the Auburn area in Placer County for almost 30 years. I've been in the foothills most of my live and I've been up here northeast of Sacramento for about 30 years.

How did you decide to work in agriculture and go to school where you did?
I am one of those people that has taken a long time to figure out what I wanted to be when I grew up and whether I was going to grow up at all to begin with. My bachelor's degree is in agricultural economics. After college I went to work in industry. My first job out of school that wasn't working for my family was working for the California Cattlemen's Association. I did that for about six years. One of my responsibilities there was the California Feeder Council, so I got to come to the Imperial Valley a couple of times a year early in my career, which was great. I did a whole bunch of things between the California Cattlemen's Association and ending up with Cooperative Extension. One of the interesting things that happened way, way back in my first job was that two people from extension, Dr. Jim Olson and Mike Conner, who was the Superintendent at the Sierra Foothill Research and Extension Center, both sat me down at separate times and said, "Dan, you should think about Cooperative Extension." From that little seed planted clear back before 2000, it threw me on a winding path and led me here. So. The counties that I serve run from the middle of the Sacramento Valley clear to the Nevada line. I think the lowest elevation in my 4 counties is 20 feet above sea level to over 10,000 feet at the crest of the Sierra. A lot of variability in terms of rangeland types and production systems. It's a cool place to work, particularly having grown up in this kind of environment. I get to do everything from Sac Valley to Sagebrush. I really enjoy that variability and variety.

Did you grow up in agriculture? How did you decide to work in the agriculture industry?
I grew up around agriculture as part of the community that I grew up in, ranching and forestry. I didn't really think about agriculture as a career. I ended up going to Davis. I wasn't even clear on what a land grant university was when I got in at Davis. Agricultural economics seemed like the closest thing to a business degree that I could get. I was planning to go to work at my family's auction business. Once I started taking courses and getting involved in agricultural student groups on campus, I really realized that I had a passion for working in agriculture and working with livestock, in particular. College kind of pointed me in that direction, which was great.

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CAREER CALL WITH DAN MACON

Did your family's business work in agricultural auctions?
We did auctions, some were agriculture. Anything that you could sell, we tried to sell. Everything from houses to tractors to horses.

Do you think this early exposure to selling with your family's auction business help you in your communication skills?
Yes. Anybody that has ever been an auctioneer is a ham, and there is certainly an element of that for me. I'm not intimidated being on this side of a microphone, so I think that definitely helped.

Can you tell us about your job and what you enjoy the most about it?
One of the things I really like about these county-based extension jobs is just the variety. There are some seasonal cycles to the work that I do, like there is for everybody. I like that quite a bit. My program focuses on 3 broad areas. I do some natural resource work working on livestock predator issues which are pretty big for the producers here. Working on drought and wildfire which are big issues for us. I also get to do the research and a lot of teaching and a lot of extension on animal husbandry. I really like helping people build new skills and helping new producers get engaged in the network of producers that we have here. I find that really, really enjoyable. The third element is agricultural business viability. Helping people that are trying to ranch as a business improve their profitability and think about new enterprises objectively. I think producers learn so much from other producers and sometimes our job in extension is to bring people together so they can share ideas. I really find that rewarding. I love watching people talk to one another and get excited about trying new things from talking to other ranchers.

What were some challenges you experienced when you started your extension job?
My experience was probably very different than most in that I have been in the community that I'm working in already. One of the challenges for me was the size of this organization. Particularly having been a business owner, myself (we still have a small sheep operation). When I have to make a decision in the sheep business, I look in the mirror. That's the only other person I need to think about, typically. For an organization the size of UC ANR to make a decision, it's a much longer and more complicated process. Sometimes I think that can be frustrating. When we see something that that obviously needs to get done or that we need to do differently, it's not as easy us simply making that decision and moving forward. We've got to bring the whole organization along with us and that can be challenging. It probably also keeps us from going too far afield before our clientele are ready to go that far afield. There's a benefit to that.

What were some resources that really helped you when you were starting in your career?
All of us stand on the shoulders of people who took time to mentor us. There have been a number of those folks in my career that have been really helpful in that regard. In some cases, people who didn't even know that they were mentoring me with a comment here or there or simply taking the time to be able to bounce ideas off of somebody.

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That's all really valuable. As I've gone on in my career, remembering to do that for another people that have questions has been really important for me. Part of being mentored is committing to mentoring others who have similar questions or similar challenges. That's been huge for me. The other realization for me is that mentors are not always people who are older than I am. I learned a lot from people who are in school now or just out of school. Having those kinds of opportunities and relationships are important in this career just to keep our perspectives fresh and make us rethink our assumptions. I've had a chance to work with a couple of PhD students in the Animal Science department at Davis on some of their PhD research. It's been hugely valuable for me just to see the world through those eyes and be around people who are innately curious about the world. It's been really great.

A lot of us look for mentors who are doing things that we think we would like to do. There's a lot of value in that. There are a number of other advisors that I still look to as mentors just to kind of learn how to be in this advisor role and my county director role. Talking to people that seem to navigate that better than I am is really helpful. Sometimes it's hard to push myself to do this, but I think it's really important to look for mentors who are doing something totally different than what I'm doing, or see the world totally different than I see it. In some cases, looking for mentors that come from an entirely different cultures and backgrounds is really valuable. It has helped me grow as a person to be able to see the world through different eyes. I've had the chance to work with some students at Davis, one of whom comes from an entirely different background than I do, culturally and ethnically. There's a level of trust that you have to develop between a mentor and mentee and as that level of trust gets established, we've been able to have some really valuable conversations about the world and how the world sees her. That's helped me become more empathetic and more creative in the way I approach the job.

Could you just give a brief overview of the sheep industry in California?

California is really unique in the sheep industry, as we are in lots of other parts of agriculture. One of the unique things here is that due to the climate the delta down through the San Joaquin Valley and certainly down into the Imperial Valley, we're pretty dry, but we have a long growing season. Largely, California is a fall lambing system, which is unique. We're lambing when the rest of the country's finishing lambs, which means we're finishing lambs when the rest of the country's lambing. It gives us some unique marketing opportunities here. Depending on the year, California is the second or third biggest sheep state in the US and biggest producer of lambs. Usually the first or second producer in terms of wool. Wool is still really important in the commercial industry here. Because of our dry climate, most of the large scale commercial operations are fine wool sheep. Rambouillet primarily. A lot of high-end garments come out of California wool. We also have a fairly rapidly growing small and specialty sheep industry segment. Folks that are doing targeted grazing to manage fuels or manage weeds. We've got a growing sheep dairy segment of the industry which I think is really interesting. A lot of interest in sheep milk cheese. The other unique thing down in the Imperial Valley is that you've got all this alfalfa stubble and other crop aftermath in the winter when the climate is just spectacular to finish sheep. We see a lot of lambs coming out of the Intermountain States. Lambs that were born late spring that have been on public land most of the summer.

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As they bring them off public lands up there, they wean those lambs and anything that still needs to put some more weight on comes down and grazes the alfalfa down there in the valley. I haven't been down there in years to see it but those lambs just pack on the pounds down there. Such a great environment to finish lambs. They are amazing. Those lambs are all going to be in the valley until they reach the finished weight, and then they'll come back up to Northern California for processing. Just all the moving parts of the sheep industry here are neat. Really interesting.

Is there are reason more cattle people don't have sheep?

Up here, in particular, almost every cattle family, if you push them hard enough, started with sheep. Nobody ever goes to the store to buy a sheepherders hat. They always want a cowboy hat. Nobody wants a sheepherder's hat. There's a prestige to raising cattle, I think. But the other issue that drove people to cattle was the labor required in sheep. You have to put your hands on sheep five or six times a year. As labor became more costly and as predators became more of an issue, people moved to cows. What we're seeing here though, and we've done some research into drought strategies up here, is that there's been a lot of cattle people that are looking at sheep as a way to diversify their enterprise and as a drought buffer. Sheep can tolerate drier conditions better than cows.. This multispecies approach is starting to take hold again where people are adding sheep to their existing cattle operations.

Where is the sheep meat from California going?

We could probably spend the entire podcast on that question. Nationally, there are three segments of high demand for lamb. The West Coast, the East Coast, and the upper Midwest. That's largely driven by ethnic demand. Largely Muslim demand in the upper Midwest. Going into the pandemic, about half of the domestic lamb, of which about 90% was processed in California, was going to food service. It was going to hotels and cruise ships, which disappeared in March of 2020. The industry really quickly retooled and focused on retail. We saw tremendous increases in retail demand during the pandemic. People trying lamb that have never tried it. That's really a positive development in our industry. There's since been some challenges with imported lamb and price discovery and all of that, but it's not a bad thing that people are eating more lamb today than they were in 2019. I think that's a great opportunity.

What is your favorite food?

Lamb.

What is what is the best way to cook lamb?

Depends on the cut. We don't have the same quality of Mexican food as you all have in the Imperial Valley, but there's a Mexican restaurant in the mountains up by us that does lamb shanks that are the best lamb Shanks I've ever eaten. I told the guy I'd bring him a whole lamb cut and wrapped if he would give me the recipe. He refused, so I have to do some further research on what the recipe might be. I like to do a rack of lamb, Argentinian style on the grill. That's probably my favorite way to cook lamb.

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CAREER CALL WITH DAN MACON

What type of music do you like to listen to?
I'm a mid-50's guy that grew up in California, so classic rock or Americana. Steve Earle, Jason Isbell, Emmylou Harris.

What is something you know now that you would like to go back and tell your younger self?
Since nobody can see me, one of the things I would go back and tell my 22-year-old self is what happened to all your hair. On a more serious note, I didn't go back and get my masters until my mid-to-late 40's. If I were 22 and just finishing an undergraduate degree, I would have told myself not to wait that long to go back and get a masters. I think it was good for me to work for a while, but I don't think, in retrospect, that it made sense to wait until I was extremely middle-aged to try to go back to school.

What do you see in the future of agriculture and what should be focused on moving forward?
There are three things that I think are great opportunities for the sheep industry. One is that in the face of climate change in California, wildfire issues are going to be with us for the foreseeable future. Sheep, in particular, offer so much flexibility in terms of managing fuel loads. Particularly around urban areas and suburban areas. Cows do as well, but sometimes it's harder to put cattle next to a neighborhood. That's a huge opportunity for us. We need more sheep doing that kind of work. I also think that there's this renewed interest in natural fibers. Particularly as we think about synthetics and about how synthetics are made and how long they persist in the environment. There's a huge opportunity for wool. Again, not just in heavy wool quote clothing, but in performance clothing and athletic clothing and those types of things. The last thing that we saw with the pandemic is people's connection with the meat that they're eating. Their ability to source things directly from producer or as close to the producer as they can. As we get better at producing consistent, high-quality products, there's tremendous opportunity to expand on that and to develop these local marketing networks to help producers but also meet the consumer's demand.

What is your CattleCal top tip?
I definitely will plug the podcast. It's "Sheep Stuff Ewe Should Know". I do it in partnership with Dr. Rosie Bush, our extension veterinarian for sheep and goats, and Ryan Mahoney, who's a cattle and sheep producer up here in Northern California. The other tip that I would leave for producers or for students alike is to find out who your local farm advisor is. I love doing ride-alongs with people. Just spend the day and see what it is I do, because I learned a lot from that, too. Find out who your local advisor is. If you've got a question or something in your business that's been nagging you, reach out to those folks. You'll be surprised at how creative Cooperative Extension folks can be and help answer some of those questions.

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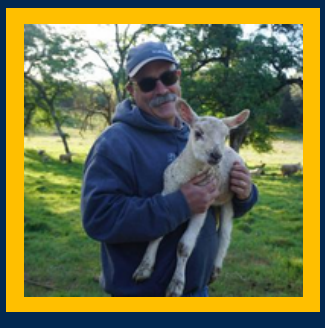
CAREER CALL WITH DAN MACON

How can people follow your work?

Email: dmacon@ucanr.edu
Blog: Ranching in the Sierra Foothils (https://ucanr.edu/blogs/RanchingintheFoothills/)
Twitter: @flyingmulefarm
Instagram: @flyingmule
Podcast: Sheep Stuff Ewe Should Know (Apple Podcast and Spotify)



RESEARCH CALL WITH DAN MACON

This month we speak to Dan Macon again to discuss his work with livestock guardian dogs for livestock.

Can you tell us a little bit about the project and how you got the idea for it?
It's a project looking at guardian dogs in a variety of different ways. The context that this grew out of was the fact that here in Northern California, we've got predators that we have no opportunity to use lethal control with. Mountain lions are specially protected in California and they certainly like to eat lambs and sheep and goats and calves. We've got black bears, which are now to some degree protected. Just to the north of my counties, we now have several established packs of gray wolves coming back into the state, which are also specially protected. Producers are looking for tools that will protect livestock that fit the rest of their operation. We have used guard dogs in our sheep operation for over 15 years. One of the things I realized when I came to extension is that when I took other producers out to see our guard dogs work, if it was during the day what the guard dogs were mostly doing was finding a shady spot and sleeping. If you point that out to the producer that has never used a dog, their first question is whether they actually do anything? Do these work? I started thinking about some ways that we could demonstrate how these dogs work and what they're doing when they're not out there watching them nap in the shade. I had the opportunity to work with some other producers and researchers in other parts of the west and we developed a program where we built our own GPS collars so that we can track the dogs' movements like every 15 minutes, 24 hours a day. Also looking to see what kind of predators were in the environment where we were putting these dogs. Working with another adviser, Carolyn Whitesell, who's a human-wildlife interactions advisor in the Bay Area, we came up with a research program that allows us to systematically and objectively document the predators in the environment and then track what the dogs are doing in response to those predators. We were also trying to figure out if the dogs having a negative impacts on wildlife. Are the dogs pushing predators onto the neighbor's property versus just making sure that they're not eating lamb or goat or calf? That project has now been going on about four years. It has been really, really interesting. One of the questions that producers have for us is how do I know there's even predators in my environment? I'm paying for all this dog food and paying for the vet bills. Is it really worth it? I think that's part of what we're trying to answer with this with this project as well.

Do you have any results from the four years you have been working on this project that you could share?
One of the ways we designed this project is to look at wildlife presence before, during, and after grazing in that environment. And one of the interesting things that we're finding is that prior to the arrival of the livestock and the dogs, we see a lot more mesopredators. We'll see coyotes and foxes and Bobcats. While the sheep and the dogs are present in the environment, we see very few of those. It takes a little while for those predators to come back after the dogs and the sheep get moved out of the area. There's this residual impact that I suspect of having the dogs in that environment. We have not documented any direct confrontations or interactions between predators and dogs, which I think is also interesting.

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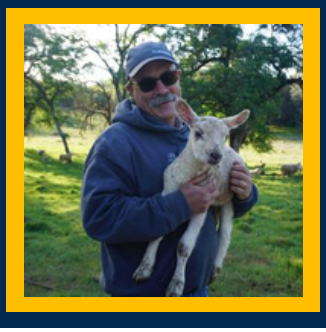

RESEARCH CALL WITH DAN MACON

I think it's more that the dogs are filling a niche in that environment while they're there with the sheep that would otherwise be filled by these canine predators or mountain lions or bears. But they're not fighting them off or doing those types of things even in open range environments where we've tracked them up on National Forest land. I think it's more just the presence of the dog than actually fighting predators off. We do see some impacts to some degree on smaller wildlife. If a raccoon or a possum wander into where the sheep are, the dogs will take those animals. I've actually witnessed my guard dogs trying to chase a river otter out of the pasture. If you haven't been around river otters, they're mean animals. They won't kill a sheep, but they're definitely mean animals. That part has been really interesting. I think we've confirmed some things that we assumed, like that the dogs are much more active at night, which you would expect. We've also found with a particular flock in an open range up in the mountains, about 1200 sheep that had two dogs with it, that one dog was with patrol much more widely during the day and come back and stay with the sheep at night, and the other dog would patrol more widely at night and come back to the sheep during the day. I thought those roles might be more fluid, but at least for this particular group of dogs, it was pretty well-defined roles. One was the night shift, and one was the day shift. That's an interesting dynamic as well.

When you say guardian dog are you talking about a specific breed? What qualities would you look for in a guardian dog?

There are specific breeds in in this country. Most of the breeds are what we call big white dogs. A lot of lot of folks have heard of Great Pyrenees, which is one of the breeds that we use. The other breeds are all from Asia or southern Europe. The other breeds that are common here in California are Akbash, which are dogs from Turkey, Maremmas, which are from Italy, Anatolian shepherds, which are also from Turkey. We're seeing some new breeds like Kangals, which are Turkish dog, Transmontanos, which are from Portugal, Karakachans, which I think are from Bulgaria somewhere. They're all specific breeds and they've been selected over thousands of years to be trustworthy with livestock. They typically don't have much prey drive, so they're not hunting dogs. I think they think of themselves as sheep that happen to have big teeth. In selecting a dog, just like with any kind of working breed, it is really important to select puppies from a working environment. There are pet Pyrenees and they're great. They can be great pets. But that's not the genetics that I'm looking for as a sheep producer. I want a puppy from where I could see his parents working. Where the puppy was whelped where it can smell and hear livestock before its eyes are open. I want it to be comfortable in that environment and seeking that environment. There are some things that we could do to test a potential pup. If you roll a ball by a border collie pup, they're probably going to chase the ball. If you roll a ball by a guard dog pup, they should ignore it. They don't have that prey drive that a dog that's herding or hunting would have. You don't want the pup that's always hanging in the back, but you also probably don't want the pup that as soon as you come in, runs up and jumps on you. You want that one that's kind of checking you out, not afraid of you, but not wanting to be with people all the time, too.

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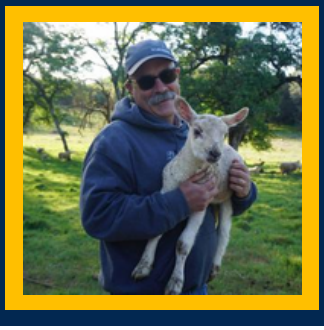

RESEARCH CALL WITH DAN MACON

How many guardian dogs should I have? Does it depend on the size of the herd or amount of space the dogs are protecting?

It really does depend on a variety of factors. How complex is the habitat that you're operating in? If there's lots of cover for predators and lots of predators on the landscape you probably need more dogs than you would on the alfalfa in the Imperial Valley. Different environment. Part of it has to do with the relationship between the production calendar that the producer is operating with and the time of year that the predators are dealing with. For example, our operation lambs in late February and March. There's not a lot of natural prey out there for the predators. That's a pretty rough time of year to be a coyote in our environment. As a consequence, we need more dogs per sheep than we might need if we were lambing at a different time of year. Conversely, this outfit up north of Truckee, that we've worked with on this research, runs three bands up there. 1200 ewes per band. They're all dry ewes, so there are no lambs with them. They're dry ewes that can get out and move and are mature sheep. They use one or two dogs per band with great effect. That's because there's lots of other things for the predators up there to eat in July and August. The sheep are pretty self-sufficient at that point. They're not trying to protect lambs. It really depends on where you are and when you're there for the ideal number of dogs.

Is there any difference between male and female guardian dogs?

There are some differences. One of the things we're hoping to be able to look at is if there is value in having intact males in areas where gray wolves are present? Does that make those dogs a little more aggressive and protective? We're still working on how to ask that question. Neutered males tend to roam less generally. For most run-of-the-mill operations, a neutered male is probably a pretty good option. Females can also be really good. One of the things that we have found occasionally within intact females that haven't been spayed is that the first time that they experience lambing or kidding, their maternal instincts go into overdrive. They may try to take that lamb from you because they want to take care of it. Generally, they grow out of that. Once the first lamb hits the ground, they're all over it. Once there's 75 or 100 lambs being born a day, they realize they can't deal with this. Then it usually resolves itself. That's something that we try to look for and help the dog work through.

Looking at this project, you're working with livestock, you're working with wildlife and now you added a third variable in there working with the dogs as well. Could you talk about just a couple of the challenges you had with this project?

It's just as you described. How do you control all of those variables? What are you actually testing? That gets further complicated if you're working with the producer. Who wants to be the control group? Who wants to have the unprotected sheep to see if the dogs are effective with the other group of sheep? What we decided early on is that we don't want to put anybody in that position. That we want to understand the mechanisms of how these dogs work rather than if guardian dogs work or not. We really tried to analyze behavior and relationship to the environment, movement patterns, and those types of things rather than “Group A has a dog and didn't lose any lambs. Group B has no lambs because they have no dog and all the lambs got killed.”

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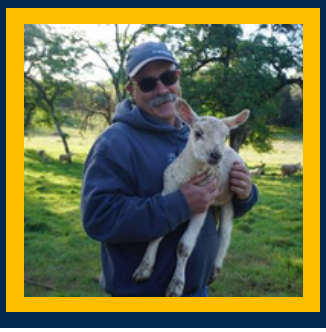

RESEARCH CALL WITH DAN MACON

I think that's one of the challenging issues. The other is that every environment is different, even on neighboring ranches. My whole production system in our operation is geared toward the fact that I can't be there 24 hours a day, seven days a week. We use electric fence, we're moving sheep frequently, we've got dogs with them. All those things contribute to our ability to protect our sheep from predators. The neighbor may have hard wire fences, live on the property, be there most of the time. They may shoot at coyotes where we don't shoot at coyotes. How does that interaction change the effectiveness of the tools that we use versus tools the neighbor uses? Lastly, we call these tools, for lack of a better term, but they're biological systems. The dogs are making decisions every day. The predators are making decisions every day. People say that that sheep are stupid, but sheep are making decisions every day as well. All of that dynamic changes from the interactions with predators and the interactions with the environment. Where we've landed is that there's some ways to test some of these questions, but there's also a real need to objectively document case studies where these tools have worked and where they haven't worked so that we begin to build this larger database of all these different variables. We can help people look at pieces of our research and say that kind of fits my operation. Help them navigate those questions a little differently.

What is next for this type of research in the future?

There are a couple of things that really interest me. We are doing a demonstration of how to bond these dogs with cattle. It's done a lot in other parts of the world, but not real common here. There's a need to do more of that and figure out not only how to bond the dogs with cattle, but how to get the cows to accept the dog. It goes both ways. This is going back to just being observant. Thinking about things that we all see in our day-to-day work. When I collared the dogs that were in Truckee this year, I met the operator at their shipping corals over in Virginia City, NV. I was there when they brought these sheep into the corral. Like any animal, coming into the corals is kind of a high stress situation. Crowded together, you're going into a novel environment. I watched these sheep approach the corral. All of a sudden there was one of the guard dogs. He was with his band out in front. He calmly walked into the corral and the lead sheep saw the dog and said, “It must be OK,” and came in and followed him. One of the things I think would be really interesting to do is to measure stress levels in protected flocks versus unprotected flocks and relate that to grazing behavior. My theory is that sheep that are with the dog are going to go into range areas to graze that they wouldn't go to otherwise. I think relating the dogs to grazing efficiency and efficient use of our resources would be a really interesting question to trying to address.

Anything else you would like to add?

The only thing I would add is that from a purely selfish standpoint getting to be out in rangeland watching these dogs is a great antidote to having to be in the office. If nothing else, it gets me out of the office out and into the open spending time outside. That's been as much fun as any other research that we're doing.

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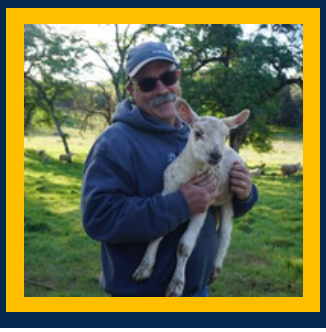

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Where can people learn more about this research?

If folks are going to the California Cattlemen's Association meeting in Reno next month in December, we will have a poster on that project. We'll put that poster on our website after the meeting as well.

Blog: Ranching in the Sierra Foothils (https://ucanr.edu/blogs/RanchingintheFoothills/)

Dan's Livestock Website: https://ucanr.edu/sites/Livestock/

Dan's Livestock Protection Webpage:
https://ucanr.edu/sites/placernevadasmallfarms/Livestock/Livestock_and_Predators/

FEEDLOT RESEARCH BRIEF

Carcass characteristics of Beef x Dairy Crosses

Introduction

- Dairy and beef semen sales were steady from 2013-2017
  - In 2020 beef semen sales were up by ~5 million units and dairy semen sales were down by ~5 million units.
  - Since most dairy animals are bred via AI and beef are not, this change can be attributed to dairy breedings
- Based on US dairy production standards, ~ 5 million dairy or beef x dairy crosses may end up in the US beef supply.
- Actual numbers of dairy x beef crosses slaughtered are not recorded, but packers have stated that the number of crosses has increased.
- We need to better understand the impact of beef on dairy crossbred animals on carcass and meat characteristics.

Consumer Preferences

- Dairy beef is often seen as inferior to typical beef breeds, which is inaccurate.
- Concerns with dairy beef:
  - Color stability for retail (greater oxidative metabolism)
  - Steak shape (more triangular and smaller)
- Research shows a reduced need for concern for eating qualities for beef x dairy crosses.
  - Showed not different from typical beef breeds.
- Tenderness
  - Consumers have rated dairy steaks as most tender compared to crossbred beef x dairy and typical beef breeds.
  - Beef x dairy crosses seem to be an intermediary for tenderness and flavor between dairy and beef breeds.
- Consumer preference wasn't different for beef x dairy crosses, dairy, or beef breeds.
- Dairy genetics may influence eating quality attributes of beef x dairy crosses.

Carcass Performance

- Early beef x dairy crosses focused on black hides to gain premiums and avoid dairy discounts or refusal.
- Hide color seems to now be of lower importance than before.
- Some packers have begun discounting beef x dairy crosses for several reasons:
  - Liver abscess
    - Beef x dairy experience an intermediate amount of liver abscess compared to dairy (greatest liver abscess incidence) and beef breeds (least liver abscess incidence)
  - Red meat yield
    - Crosses have an intermediate ribeye area and fat thickness compared to beef and dairy breeds.
    - Similar KPH to dairy breeds
    - Dressing percentage = 63% (dairy = 61%)
    - Slightly less salable red meat than beef breeds but more than dairy breeds.
  - Percentage of prime grade is lower than dairy but greater than beef breeds.
    - Crosses may get some benefit from dairy genetics but high variation might reduce number.

Calving Performance

- There are several benefits that may come from crossbreeding dairy and beef cattle for beef production compared to straight dairy cattle:
  - Increased animal health
  - Decreased death loss
  - Decreased days on feed
  - Increased efficiency
  - Increased carcass yields
  - Increased color shelf life stability
  - Increased marbling and eating quality from dairy genetics
  - Seedstock companies can identify sire appropriate for those crosses

Conclusions

There are many potential benefits to crossing beef x dairy compared to both beef and dairy breeds including eating qualities of the meat, yield, quality, liver abscess, etc. More research needs to be conducted on the impact of crossbreeding on carcass characteristics.

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.

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