

5TH ANNUAL BISON WORKER SAFETY & HERD HEALTH ROUNDTABLE

JUNE 14-15, 2023

FLANDREAU, SOUTH DAKOTA



AgHealth
Central States
Center for Agricultural
Safety and Health

ROUNDTABLE PARTICIPANTS

Summer Afraid of Hawk, ITBC Intern – Buffalo Seed Keepers Program

Ray Alvarez, ITBC

James Arpan, Dakota Language

Brady Badwound, ITBC Intern – Buffalo Seed Keepers Program

Edwin Brokesh, Presenter/KSU

Del Chisholm, Taos/ITBC

Shaina Clifford, ITBC

Annika Covington, CS-CASH

Dave Crites, Presenter/TEI

Samuel Crofut, Pteoptaye

Ehakela Cummings, ITBC Intern – Buffalo Seed Keepers Program

Josef Drywater, Cherokee Nation

Ellen Duysen, CS-CASH

Jon Fighter, Crow Tribe Bison

Butch Garner, Cherokee Nation

Amber Geigle, Meskwaki Natural Resources

Randy Hawk, Panel Speaker/Cheyenne Arapaho Tribes of Oklahoma

Megan Hawkins, Presenter/ITBC

Troy Heinert, ITBC

Weston Henson, Cherokee Nation

Mike Hildreth, SDSU Science Department

Trent Holland, Cherokee Nation

Arlo Iron Cloud Sr., Diné and Oglala Lakota Nations

Lisa Iron Cloud, Oglala Lakota Nation

Kelsey Irvine, CS-CASH

Richard Jones, FSST Buffalo Ranch

Letishia Kelley, MTK Visuals/SDPB

Jonathan Kelley, MTK Visuals/SDPB

Jesse Lasater, Southern Ute Tribe

Mary Miller

Matt Nonnenmann, CS-CASH

Zane Old Bear, Meskwaki Natural Resources

David Peters, Forest County Potawatomi's Bodwewadmi Ktegan

Thomas Peters, ITBC Crew Leader – Buffalo Seed Keepers Program

Jessica Post, UNMC Animal Behavior Core

Eric Pulis, Presenter/Northern State University

Risto Rautiainen, UNMC CPH

Mikiya Reuther, ITBC Intern – Biology

David Ross, Panel Speaker/FSST Buffalo Ranch

Maria Sam, Picuris Pueblo

Myстера Samuelson, UNMC Animal Behavior Core; CS-CASH

Olivia Schouten, Kankakee Sands Preserve Bison Herd

Jonathan Schrader Sr., FSST Buffalo Ranch

Julian Shavanaux, Ute Indian Tribe

ROUNDTABLE PARTICIPANTS CONTINUED

Leroy Stewart, Crow Tribe Bison Management

Kalon Strickland, Panel Speaker/Santee Sioux of NE

Joanna Studt, Presenter/ITBC

Ralph Tallbear, Cheyenne & Arapaho Tribe

George Toya, Pueblo of Nambe Buffalo Program

Donavan Waupoose, Menominee Tribe

Chance Weston, Thunder Valley CDC Bison Restoration



ROUNDTABLE AGENDA

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5TH ANNUAL BISON WORKER SAFETY & HERD HEALTH ROUNDTABLE

SHAKOPEE ROOM | ROYAL RIVER CASINO & HOTEL | FLANDREAU, SD

ALL TIMES ARE IN CENTRAL DAYLIGHT TIME

WEDNESDAY, JUNE 14, 2023

8:00 AM – 8:30 AM	Breakfast (provided)
8:30 AM – 8:45 AM	Welcome Dr. Mystera Samuelson, UNMC CS-CASH
8:45 AM – 9:30 AM	Summary of project and future directions Dr. Mystera Samuelson, UNMC CS-CASH
9:30 AM – 10:00 AM	Food Safety in the Field Joanna Studt, ITBC
10:00 AM – 10:15 AM	Break
10:15 AM – 11:30 AM	Buffalo Herd Managers Panel Randy Hawk (Cheyenne Arapaho), David Ross (Flandreau), Scott Anderson (Flandreau), Kalon Strickland (Santee Sioux)
11:30 AM– 12:00 PM	Lunch (provided)
12:00 PM – 12:30 PM	Low-Stress Handling and Corral Design Dave Crites, Fawn Lake Ranch, Turner Enterprises
12:30 PM – 1:00 PM	Biosecurity and Safety During Buffalo Transfers Megan Hawkins, ITBC
1:00 PM – 1:15 PM	Break
1:15 PM – 2:15 PM	Parasites in Bison & Demo Dr. Eric Pulis, Northern State University
2:15 PM – 2:45 PM	Equipment Design & Safety Dr. Edwin Brokesh, Kansas State University (Joining via Zoom)
2:45 PM – 3:00 PM	Break
3:00 PM – 4:30 PM	Tailgate Training Refinement & Project Input Kelsey Irvine, UNMC CS-CASH
4:30 PM – 4:40 PM	Summary and Thanks Dr. Mystera Samuelson, UNMC CS-CASH

SEE BACK FOR DAY 2

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Safety and Health by NIOSH AFF Grant U54OH010162*



ROUNDTABLE AGENDA CONTINUED

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THURSDAY, JUNE 15, 2023

7:00 AM	Breakfast (provided)
Transportation to demonstration harvest	
8:00 AM	Ceremony at Buffalo Ranch, followed by demonstration harvest.
12:00 PM	Lunch provided by the Flandreau Santee Sioux Tribe, prepared by the Wateca Bowl restaurant. <i>At the Wicoicaga Otipi Community Center</i>
Around 1:00 PM	Thanks and Close

Thank you to all who presented and participated at the 5th Annual Bison Worker Safety and Health Roundtable. During this meeting, enduring partnerships were established, and best practices that were discussed can be implemented to protect the safety and health of bison herd workers and their animals.



ROUNDTABLE PRESENTATIONS AND DISCUSSION

Mystera Samuelson

EAOH CS-CASH, UNMC Animal Behavior Core

mystera.samuelson@unmc.edu

Introduction and Welcome

Summary of the Project and Future Directions

- History:
 - Project started with Dr. Clayton Kelling, who noticed a high injury rate and equipment deficiencies.
 - He conducted a survey looking at other risk exposures. Results found included:
 - Excessive dust during processing
 - Corral system deficiencies
 - High chance of animal contact at chute openings
 - Lack of low-stress handling
 - He got funding for this project to get people together to discuss these issues.
 - Bison worker safety tailgate training guide
 - ITBC conference safety training courses
 - Roundtable conference
- Future directions over the next 5 years with the renewed grant:
 - Shift in focus to Tribal bison producers: Highlighting what is already being done and addressing ongoing concerns.
 - Continued monitoring for injuries and workplace hazards.
 - Get input on how to make things more appropriate for you.
 - Annual roundtable will continue.
 - Focus on barriers to low-stress handling and facility improvements.
 - Tribal-led mentorship in herd management.
 - Working with ITBC to make connections between people willing to mentor and who would like the mentorship.
 - Sponsor up to 6 scholarships for domestic travel and possibly room and board each year.
 - Want to focus on connecting similar regions and herd sizes.
 - Goal for this year is to find mentors: Please reach out if you are willing to be a mentor.
 - Get in touch with Mystera (mystera.samuelson@unmc.edu) or Joanna (joanna@itbcbuffalonation.org)
 - They will discuss your environment, land size, herd size, etc.
 - They will work with ITBC and newer members who might want to learn from you in coming years.
 - Shift in training materials.
 - Want to showcase indigenous expertise and provide culturally appropriate materials.

Attending this year's meeting, Jonathan and Letishia Kelly are photographers/filmmakers, full-time creatives, who live in the community. They were approached by PBS to cover the meeting (both days) and put something together for their Dakota Life Series. They will be filming and photographing the meeting and doing some interviews.

Joanna Studt

Project Director, ITBC

joanna@itbcbuffalonation.org

FOOD SAFETY IN THE FIELD

ITBC Brief History

- ITBC began in 1992 as a non-profit. In 2002 it became a federally chartered Indian Organization.
- Represent about 20,000 buffalo across 81 Member Tribes and 21 states.

Field Harvest Safety

- Main concern with field harvest is pathogens contaminating meat (bacteria or viruses such as E. coli or Salmonella).
 - Sources can be in the animal (ex., intestines), the environment, workers, tools, or equipment.
- A well-thought-out process and planning ahead can be the best preventative.
 - Improve each time you do it.
 - A checklist can help with planning and making sure all the needed equipment is there.
 - Consider the environment and what would be a good location to harvest and process an animal.
 - Tarps can be very helpful in keeping meat or organs off the ground.
 - Measure, Monitor, and Validate your process – make sure what you are doing is working well for you.
 - Training – Don't be afraid to teach and learn new things.
- Best Practices:
 - Execute established processes and procedures with trained staff.
 - Establish methods to measure and verify procedures and identify corrective actions for deviations.
 - Wash hands and surfaces frequently.
 - Avoid cross-contamination.
 - Keep equipment clean and sanitized.
 - Cool meat as quickly as possible – Maintain an internal temperature of 40 degrees.
 - Avoid heat and moisture.

QUESTIONS:

- Last year, we had a couple of presentations about finding an anomaly when you are harvesting, or you come across something that looks odd. Take some pictures with a ruler (size reference), and take samples of the area, if possible, for a veterinarian if they are not in the field with you. That will give you some hints, at least. They may not always be able to tell you exactly what it is, but usually by the photos and if you can get some of the tissue samples, they might be able to give you some hints about if there might be something going on with your herd, or you might have been exposed to something, or it's no big deal at all. That size reference is very important and helpful, so maybe keep a ruler in your kit. (Mystera Samuelson – UNMC, CS-CASH)
 - Necropsy training – designed as if you were doing a field harvest to gauge healthy and unhealthy tissue. Have a few sample bags ready to go. We hope to have resources come out of that training for those who were not able to go. (Joanna Studt – ITBC)
- Arlo, when you presented, you mentioned that certain organs might be consumed raw or not fully cooked. For a field harvest, do you suggest harvesting any particular part of the animal first to get it chilled and served later, or do you have an order of operations that is preferred? (Mystera Samuelson – UNMC, CS-CASH)
 - What would be the most ideal thing to process or harvest right away? We aim for organ meat right away. We try to take care of those things initially. We eat everything raw because our ancestors did. Depending on where the animal is kept, taken care of, we'll normally try those things raw. We are practicing what our ancestors have done, so we are using that as our guidebook. (Arlo Iron Cloud Sr. – Diné and Oglala Lakota Nations)

PANEL DISCUSSION:

BUFFALO HERD MANAGERS

Facilitated by: Joanna Studt

Panelists: Randy Hawk (Cheyenne Arapaho Tribes of Oklahoma)

David Ross (FSST Buffalo Ranch)

Kalon Strickland (Santee Sioux of NE)

Tell us a little about your individual programs.

Randy: Bison manager for about 12 years. Heard started in the 1980s. Right now, we have 530 head at Concho and 560 at Wheeler Feedlot. Take care of our people first before we break out. We have a crew of 5 people, been working together for about 5 or 6 years. Going to different ranches to learn from different people. Donate to our ceremonies and diabetes wellness; just try to take care of our people. Fecal samples go through Texas A&M. We have 2,800 acres, but all pastured, so we rotate them. Burn grasses every two years to make better pasture and pulling trees, trying to make more room.

David: Help with buffalo herd on and off since I was 18 years old. In 1990 we first started getting buffalo. We utilize the meat and have them butchered. We used to give it to the diabetes program when we had one, but now we give it to those who request it or need meat. In 2019, the herd size became too large for the current pasture, 280 acres for 250 animals, so we culled the herd. Fourteen got missed over the hill. We asked for a bull from Mr. Strickland and the Santee, as the 14 were all cows. In 2021 we had 70 animals. Last year we had 45 calves. This year we had another 47, so we are up to 162 animals. Getting up to the herd size exceeding the pasture again, so we are going to be adding another 40 acres. Currently, we have three employees. Dr. Hildreth from SDSU helps with fecal samples and the tagging/separating we do every year in the fall.

Kalon: Run herd about 30-60 head. We've had about a 6-year drought now, so we've been feeding non-stop. I've been a manager for 25-30 years now. I started out in a feedlot in Jefferson, SD. Learned to work with animals in a pen. Bison are different. You can kind of herd cattle where you want, but in bison, you've got to trick them. Make them think that's where they want to go. At one time, we had almost 500-600 acres, but we had to cut it back. The Tribe recently bought more land to expand our pasture. We try to work with the school and the diabetes program, but the elderly don't seem to like buffalo, so we've had some struggles there. We try to make things available in the community. We might have to cut it down because of the drought. We usually only supplemental feed in winter. Work with a vet once a year to look things over and check for parasites. We have field harvests but usually don't have roundups.

If your Tribe does have roundups, what are the main goals of the roundups (pregnancy testing, tagging, vaccination, etc.)?

Kalon: Don't have annual roundups or anything. Small enough herd that we just watch the herd while they are calving.

David: In winter, we separate bulls from cows and calves. We keep them in a holding pen in winter. Makes it easier and a little safer for everyone if we need to process a bull. When we bring them in, the calves are tagged.

Randy: On our roundups, our main thing is to put eyes on each animal and make sure they get a vaccine. Most of the time, we go off our fecal tests and do field treatments. Weights, tags, ids. Separate what we want to keep.

What are some lessons learned pertaining specifically to worker safety when working with the animals, not just for roundups?

Kalon: Any time you have anyone come in; you need to make them aware of what can happen. How fast bison can move if they really want. Make new people aware of the tail; watch the tail. Everyone who works with bison knows the signs of the tail. Keep people close to the vehicle if out harvesting in the field. In a corral, let the bison calm down and work them a little bit at a time. Make sure you are aware of your surroundings and escape routes.

David: Before we do any handling, we go through, maybe the day before, and check all the gates to make sure they are working properly, grease them if needed, or put chains on. Before a roundup, we have a meeting with everyone to go over the game plan. Someone will say a prayer to make sure everyone is safe for the harvest.

Randy: We lay everything out and walk through the alleyways. Usually have about 13 people when we work the herd, and we just place them where we need them. Then we walk through different scenarios of what could happen. When we bring them in, it's low stress. The way I look at it, we are training these animals when we bring them in; if they have a bad experience, getting pushed around or yelled at, they won't want to come back. We make everything smooth and streamlined; there's no yelling. Our main things are tarps. We sit there and let them settle down, separate themselves basically—a lot of repetition.

Since the focus for tomorrow will be a field harvest, can you give us a take on how many field harvests you do a year, the process of that, safety measures you implement?

Kalon: We do about four field harvests a year. Go out in the morning and have someone say a prayer. If we see one or two come out of the herd and separate themselves, we take it as a sign of whose time is come. We harvest one for the diabetes program and a few for religious purposes.

David: In the past, we would send them to the locker and have them butchered there. Last year we started doing our own field harvest. We had Arlo come down and help us with that. Since then, we've done two; this will be our third one. Years ago, we used to do it on our own before we started sending it to the butcher. We are bringing back doing it ourselves and bringing the community together to learn and that comradery.

Randy: So far this year, we've butchered 5 in the last three months, teaching culture and heritage or someone needs a buffalo for a community. We go to 4-5 different communities teaching culture and heritage, especially to schools. Let everybody learn.

Kalon: We had a hard time finding a locker that would take them. I think things are changing for the better now.

Do you have an emergency response plan in the event they get out?

Kalon: I always made sure local police had my number. I made arrangements with the game and parks department so that should anything happen, they could get ahold of one of us. If one got out, it was usually 3 or 4 in the morning. Always have to be ready to move. We've had issues where they went cross country, and local farmers and ranchers would shoo them on, making it harder on us. Try to be diplomatic with your local farmers and ranchers.

David: When we usually get a call, it'll be a calf. Local police would give us a call. Make sure locks on your gates lock. Let people who keep an eye out know when someone is going out by the herd, such as a vet.

Randy: We get calls from security from time to time. Take the truck, and a lot of times, they would follow us back in. Maintain gates being left open.

Kalon: A lot of times, when an animal would get out, if you watch them, they'll go back in the same way they got out, most of the time. Unless you drive them away from that, but if you give them the opportunity, they will go back in the same way they got out.

I get that our relatives are very sensitive when it comes to bison. There is a lot of cultural significance with our relatives with bison across all Tribes. I'm learning there often is a misconception of what the reality is of taking care of these animals, and sometimes you run into this situation of people who take offense to how we manage bison. What are your thoughts about how do you deal with that sensitivity? (Arlo Iron Cloud Sr. – Diné and Oglala Lakota Nations)

Kalon: I've been attacked on Facebook a lot of times. A few times, we have some older cows that aren't worth harvesting when they get to a certain age, I just let them be, but people say we are starving them to death. I try to tell them not everyone is a big, healthy, strong bull; we are going to have some older elders out there too. I try to remind people of the connection between us and them. They were put here with us. Everything we've learned, we've learned from them. Everything is similar, we were put on a reservation, a little bit of land after roaming free all this time, and the same thing has happened to them. Now we are coming back a little bit, and so are they. We are trying to do our part, trying to bring the herd back. We can only do what we can do with what we are given.

David: When we do roundups, we don't give them antibiotics; it's just natural. We let the herd kind of take care of themselves. People in the community ask why there isn't a vet that takes care of them. We just let them live. When you start putting those antibiotics into them, it's going to go from the animal to us, so we try to keep it as natural as possible. You're going to have people that are going to complain about it. When we go to butcher the animal, you can do custom or USDA butchering. We use USDA, so there is an inspector there. One time I was going to use a hotshot and give him a zap to get him off the trailer, and the USDA inspector said no because it would put adrenaline in the meat.

Randy: We don't have too many people say too many things. We try to get to each community and do a buffalo slaughter with that community. Try to keep all the communities involved and fill all the requests we can. No one really gives us too much of a hard time.

For Kalon – Do you have, or have you had any plans to help share the health benefits with your community to help them understand the purpose of our buffalo? (Donavan Waupoose – Menominee Tribe)

Kalon: We have a health fair every year. We try to inform everybody. The biggest complaints we got were that the buffalo was dry, and I said that's what makes it healthy. We put on a nutrition program with ITBC on how to cook bison in different ways and use natural oils. The diabetes program explains the benefits. I haven't personally gone out and given presentations, but other people have in our communities.

Do you or your program work towards any cultural activities or cultural teachings, maybe when you gather your buffalo? Do you invite the public to learn or bring someone out to talk about that and try to reestablish that connection? (Summer Afraid of Hawk – ITBC Intern)

Kalon: This weekend, Gala Drappal Jr. with the Yankton Sioux Tribe brought a class out to field harvest one of our buffalo. It was a class, like educational. We talked about how a relative would come out and sacrifice themselves with the prayer. When we are doing those things, we try to educate them the best we can. I have handouts from ITBC that we give out about nutritional value and cultural value. I try to make all those things available. People are always welcome to come. If they want to buy meat, we have that for sale. I also try to give ITBC's number if they want any documentation.

David: Arlo and Lisa came out, and little kids and many members of the community came out and participated in that, and we will be doing that annually. A lot of good storytelling and joking around.

Randy: On our roundups, we try to keep it the same people. We keep it at a certain number, with fewer people, less movement, and less stress on the animals. We do a lot of buffalo tours, average 3-4 a month, and we educate people the best we know how with what works for our program. Try to keep everybody involved.

I work with local programs and communication like radio. How do you communicate with your relatives in your community pertaining to bison management? (Arlo Iron Cloud Sr. – Diné and Oglala Lakota Nations)

Randy: Local tv came out and filmed us, little series once a month with different programs.

David: We will use the Tribal Facebook page. Try to get as many people involved as possible. When we bring the animal back to the community center to harvest, everyone is there to get involved.

Kalon: We report to the council. All program managers report on a rotation. We give an annual or semiannual report on the herd and what is available to harvest. Most of the time, the community comes to me if they have a question. We have a small community.

Mr. Ross, I had a question, but you already answered it about keeping things natural. Yesterday before we collected those fecal samples, we were digging around in a couple of older pies, and you have a lot of dung beetles out there. Just realizing the other relationships you're assisting by not using antibiotics.

(Thomas Peters – ITBC Crew Leader)

Over the years, I'm sure you've made changes to your corrals and facilities, has there been one design change or equipment purchase that has really helped with getting the bison through quicker, with less stress, and things like that? (Jesse Lasater – Southern Ute Tribe)

Randy: We made some changes to our corrals. Mainly, the thing I noticed is that we changed our coverings, covering from 3 feet to 7 feet on all our alleyways, all our gates, and everything we could. That really seemed to help move them along.

David: Last May, we had a big storm take down our barn. Over the years, utilizing the same paneling system that has been there since the 90s. After last year's tagging and separating, some of the welts started to pop off. Things we are going to have to fix this summer. We are looking at needing to redesign the whole system.

Kalon: We reduce the size of our catch pens down to our tub and alleyways.

What other species have you noticed that have come around or been more revived since you've had your bison herds? (Arlo Iron Cloud Sr. – Diné and Oglala Lakota Nations)

Randy: I know we've got dung beetles; I've seen them. When we deworm, we use Cydectin, so it won't hurt the dung beetles. Everything we've got is native pastures, and we try to keep it that way. We see prairie dogs, coyotes, quail, and lots of good species and habitats. It's good for the soul.

David: We were talking about flies and barn swallows that eat the flies. So, we were looking at building a board or fence in the pasture with the buffalo for the swallows to make their nest and eat the insects bothering the buffalo. We did notice an increase in swallows, and we noticed the dung beetles. There are a lot of insects, grasses, and a lot of different things that affect the buffalo and how they play a part in the whole ecosystem.

Kalon: I guess no matter where you are, you're going to create a mini ecosystem with your herd. We have a highway on one side, a golf course on another, and a casino on another. So, all they have is where they are at. There is a cattle herd on the other side. I notice a lot of deer; it must be the place to hide out during hunting seasons. I don't know how they get in there, but the deer, along with the coyotes and whatever else, the beetles. It creates its own little mini ecosystem.

I liked Mr. Strickland's comment about how the buffalo are kind of like us; that they once roamed free, and now they are confined like us on reservations. Regarding the comment about how Tribal members don't like buffalo meat, the taste and different, unusual types of vegetables or different meats that people have to develop a taste for. Most adults are set in their ways and are not going to change regarding what they want to eat. What we do, is target the young kids, the youth, because, as kids, their minds are open, and they are willing to try anything. They can develop those tastes. They tend to like different things, whereas adults like the same thing over and over again. It's educating the youth that is the main goal to open their minds to other, different ways, different foods, and different experiences that we didn't have. So that's our goal in our farming programs and bison programs. (George Toya – Pueblo of Nambe Buffalo Program)

Kalon: In our community, we are the same way. I didn't mean all our elderly, just certain ones. Like you said, we get stuck in our ways; change is hard sometimes. I think it takes a while to get used to things. Our community is really into the gardens and gardening right now.

Our prairie has changed a lot from precolonial times and our nutrition and the bison's nutrition. Going out in your pastures the past few days, there are a lot of invasive grasses. I'm curious if there is or has been, any research on what the bison are grazing on now with all the invasives and if there is any push to re-establish the native grasslands? (Ehakela Cummings – ITBC Intern)

David: That's why I had you come out and do it. That's the beginning process. We have a crop share with one of the farmers with their local hay, and that's what we used to feed the animals in the wintertime. The study you're doing is the beginning part of us getting that back, to creating the native prairie again.

Joanna: To add to that, a lot of times, we can't control what the landscape is prior to putting buffalo back on it. Even though it might be non-native, it still possibly has high forage value.

Just a quick thank you for getting up here and sharing those experiences. I think that's really important as far as moving forward and understanding what really goes on as far as being a herd manager. What I want to know is about each of your experiences with the connection with the buffalo. Can you tell us about that connection, that relationship each one of you has, and how it is important on a day-to-day or yearly basis? How does that relationship, connection, reconnection that you are trying to have correlate to your own life as a human as opposed to the buffalo? I'm also really curious, do they understand English, or just the native language, or is it just a different language? (Letishia Kelley – MTK Visuals/SDPB)

Randy: Every morning, we get out there and work with these animals. It's the best job in the world. It's 2023, but we still got these cultural connections; we still got our ceremonies. To know that, to have that connection every morning and knowing we are providing for our people, want to be better and better for the herd. That's enough motivation for me.

David: When you are out working with the herd, I don't know if they understand English, but I do know when we get them to move, we use a bag of corn, and they understand the rattling of that bag. Working with them, it's very peaceful. The buffalo is there to help us and take care of us. We use all the buffalo for everything in life, so when we go to taking that life and giving that meat to our relatives, it's a very fulfilling feeling. During COVID, we utilized the buffalo to help give out meat to our members. I think we butchered 16 bulls that year. Providing that meat for those who couldn't get to the store to get the beef, but providing that meal for them to be able to cook something at home, it was very helpful. If anything like that happens again, we will have that ability to provide for our people again.

Kalon: I think it's not a language, but body language that they understand. How you react is how they counter-react. When I do a harvest, I won't take my own truck because they seem to know that truck or the sound of that truck. When I come, they come. So, I use a different vehicle, so they won't be scared when I come in. If you study them enough, even if you just go sit out there, you'll understand them after a while. They have their own ways, their own family units. If you watch them, they'll teach you. They'll give you warnings. What's play for them might actually hurt you. They have been our teachers throughout history as far as our relatives and providers.

David: The original 14 we had and the 9 from Santee stayed off to themselves for the whole year until breeding season. Then after the breeding season, they came together and became one herd. Just sitting out there and watching is very educational, and you learn a lot.

I had a quick question about running them through the chutes. I was wondering if you have any tips or recommendations to make that a smooth and safe process? (Mystera Samuelson – UNMC, CS-CASH)

Randy: We like to use tarps. We put a 4x8 foot tarp on a PVC pole; anything bigger than them. We Walk behind them and wave it to get them to turn around and go in the other direction. We aren't screaming and yelling.

David: We usually have tarps on the sides and different chambers in the handling pen. Once they get into the tub, there's a gate that clips around it and kind of pushes them into the gate.

Kalon: We stand off and let them wander through. Once we get them into the big coral, we stand back and let them wander back over that way. We use range cake to get them in a smaller pen. Once we get them in there, we can move them fairly easily. They will push off of pressure, try to get away from you, or stay away from you if they can.

Kalon: I just want to say before we get done. No matter who you are or how big your herd is, how rich you are or how pitiful, don't be scared to ask for help. I know everybody is willing to help each other.



Dave Crites

Fawn Lake Ranch, Turner Enterprises

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LOW-STRESS HANDLING AND CORRAL DESIGN

What is low-stress handling?

- Animal centered – the animal is put first; everything is centered on the animal's needs and wants.
- Behaviorally correct – understand and use natural behaviors and try to move them the way they would normally move. Let them react to you the way they naturally would.
 - We have 4,000 animals; one person moves those animals daily.
- Psychologically oriented – work with the animal's mind vs. bodies so it is their idea, and they go where they want to go.
- Ethical and humane
- Communication, not coercion – giving clear, consistent instruction – the most important thing is being consistent. Everyone in your team needs to do things the same way.

Why is low-stress handling important?

- Less stress on the animals – yields higher quality and quantity – quality of the meat is better, less dry meat.
- Lower injuries and mortality.
 - Work all 4,000 animals in a 3-week time span; we don't lose an animal – ever!
- Higher efficiency – lower-stressed animals work easier and faster.
 - When you're working with the animal, they move quickly through the system.
 - Process all 4,000 animals in a 3-week timeframe, 300-400 a day every day.
- Safer – for both the animals and the people.
 - An animal that is worked up is more likely to hurt you than itself.
- Overall animal welfare is increased.
- Fewer handlers are needed.
 - Run ranch all year with three people; use four when processing.

The Basics:

- Handler's mindset is the most important thing:
 - Be confident.
 - Believe you can get them to do what you want to do.
 - If you falter or are afraid, the animal will know and take advantage of you.
- Minimize the time the animals are standing around – they don't like to wait any more than you do.
 - If they get stuck, that's when they tend not to want to move forward.
- Bison evolved as a prey species. They view us as a predator.
 - More people, the more anxious the animals will get – they equate us to a pack of wolves.
 - One person is most effective.
- To get the animals to move, apply gentle pressure and release; always give them a way out.
 - Apply as little pressure as possible.
 - Always give them a way out.
 - Always remove the pressure.
- Move the animals from the front or side – if you are behind them, you are chasing them.
- You can get a bison to do anything it wants to do.
 - Use a "BudBox" wherever possible – small pen, very effective for working bison.
- Let them eat while you're working them. The movement of the jaws releases endorphins that relax them.

Resources:

- Stockmanship Journal Volume 7 (free, just put in an email address): <https://stockmanshipjournal.com/volume-7-subscriptions1/>

QUESTIONS:

- [Could not hear the question as it was asked before a microphone was provided]
 - We used to have a tub. The first year I was there, we took it out. Tubs work great for cattle; they don't work so well for bison. A few animals will go. The last ones to come out are always to fight, and they spin. No way to eliminate that. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
 - We don't use hotshots anymore. We have one we keep in the squeeze chute in case we have an issue. They work great for lighting propane heaters in the winter. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- The latches you use on the gates, have you tried using any slam latches? Do you have good luck with those? (Unable to identify speaker)
 - Everything has a slam latch; I reinforce it with the slide. Especially in the BudBox, if something happens outside and they hit the gate, even with a slam latch, they can bow the gate enough that it swings open. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- Your video just showed cows; what precautions do you take when their calves are with them? (Mike Hildreth – SDSU Science Department)
 - Those were calves with them. This year's calves, that's how big they are. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- What is the width of the alleyway they are going into? (Mike Hildreth – SDSU Science Department)
 - 40-42 inches, and it's adjustable, so if we are working just calves, we squeeze that ally down to calf size. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- So, if you're working the cows and the calves, do the calves turn around on you? (Mike Hildreth – SDSU Science Department)
 - Sometimes, but not generally. They tend to want to go where mom does. We try to keep them paired so that when they go through, the calf will follow mom. We do have two alleys side by side, so we do have the ability to let the calf go in beside the cow, but that doesn't work as well for us. We tend to let everything go together at once; we don't separate them too much. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- What age calves do you generally work with? (Mike Hildreth – SDSU Science Department)
 - This year's calves, they'd be about 9 months. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- Would this work with younger calves? (Mike Hildreth – SDSU Science Department)
 - Yes, we have red ones that go through all the time. We don't catch them in the squeeze chute; we just let the red ones go. Everything else we catch and tag. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- Are you working multiple gates or doing multiple jobs, or are you just on that BudBox? (Megan Hawkins – ITBC)
 - Generally, I'm the person in the back. I'm the person that brings the animals to the squeeze chute. The next person in line is up in that alley they go into, and all they do is move the animals forward. Generally, the animals go on their own, but all the person has to do is take a step toward them, and they go forward. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- So, there aren't sliding gates in that alley? (Megan Hawkins – ITBC)
 - We have sliding gates, but we don't use them very often. The fewer times you can stop the animal, the better results you'll get. If you just let them go at their own pace, they do better. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
 - If you build new corrals or make changes to your corrals, let the animals have an experience in there that's not you working them. Open it up, let them walk through, run them through but don't catch them in the squeeze, just like a little training run that gets them used to the idea that I can go here, and I know I can leave. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- How long is it from the end of the box to the squeeze? (Jesse Lasater – Southern Ute Tribe)
 - Five animal lengths is the easiest way to describe it; each is probably about 10 feet. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)

- I noticed you had the bars above, inside the alleyways. Does that help? Because we've had problems with buffalo because they are kind of underneath on their hind ends, and they'll flip over and get stuck. (Weston Henson – Cherokee Nation)
 - That does happen every now and then, but those bars help prevent that. When we have animals flip over, it's because we made a mistake and have too many animals in there, and they are trying to get away from a bull in front of them. When I bring bulls up, I'll usually cut down my number. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- How long did it take you to acquire all this infrastructure? (George Toya – Pueblo of Nambe Buffalo Program)
 - When the ranch was purchased, they built the corral system. When I got there, there was a squeeze r tub; we took that out and got a BudBox the same year. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- Do you have any information about suppliers for this type of fencing? (George Toya – Pueblo of Nambe Buffalo Program)
 - Everything was built by Plus 1 Manufacturing out of Valentine, NE. It's all reclaimed oil and field pipe. If you are building something new, start with the squeeze chute and build backward and just add things that are going to help you. We modify every year. When we finish working animals, we make notes, then walk out with a grease pencil and mark on the corral what we want to change and, over the next year, make those changes. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- I noticed there was a little bit of standing water. Do you guys come in and spray that? (Jesse Lasater – Southern Ute Tribe)
 - We do. In fact, this year, my side project is I'm installing sprinklers throughout the whole system to keep the dust down. The last two years, it's been so dry the dust becomes unbearable. We've been using sprinklers and hoses. This year we will have sprinklers mounted up on the overheads so we can wet the whole thing down overnight. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- I also noticed some of the gates have solid metal panels on there. (Jesse Lasater – Southern Ute Tribe)
 - The main gates in the center we do solid. Mainly because you don't want to break horns. They are much less likely to get hung in a pipe system if those are solid. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- We were lucky enough to purchase some bulls from the Vermejo Park Ranch, and I noticed they had rubber coming up into the trailer, so instead of metal it was solid rubber, and I thought this was a great idea because it was really quiet when the gates were operating. (Jesse Lasater – Southern Ute Tribe)
 - If you have gates or are building gates, buy a tube of caulk and caulk under all the sides where the two metals contact, and it won't make any noise. It's just a thud instead of the vibrations. We use that all the time. You can also use spray foam, but the spray foam doesn't last as long as the caulk does. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- Do you ever have any animals that cause issues that don't want to do what you want them to? (Thomas Peters – ITBC Crew Leader)
 - Of course, anyone who tells you they don't is telling you a lie. It happens once in a while. We won't put an animal in so much stress. It's not that important for them to go in there. If they are really worked up, they just go. We won't put them in distress. If an animal gets worked up, it's not the animal's fault. It's something we did. There's no pointing fingers; that's just the way it is. We need to figure out what we did to not let that happen again. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)

- How would you implement a system like this to a herd that has historically been worked pretty rough? (Thomas Peters – ITBC Crew Leader)
 - Slowly. When my ranch manager and I started, the old ranch manager had worked them old school. We decided we weren't going to do that, but when we rolled up, the herd had a flight zone of about 800 yards. Now, it's about 15 feet. I can drive through them. The yearlings, until this year, we treated as a separate herd, and by the end of the summer, they see me roll up, and they come toward me. I open the gate and back out of the way, and they go through. It's amazing; you get this feeling of, ok, I'm working with them, not against them, and they're not working against me. All our animals, we don't feed anything. We give them a little cake right before working to get them used to coming so they'll follow us. They get to be bison, and bison didn't have that when they were out, so we don't want to give them that now. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- You said any noise is a bad noise. When you are in the corral system here, are you just walking? You're not putting your hands up? (Jon Fighter – Crow Tribe Bison)
 - Just walking, maybe half the time I'll have a paddle, most of the time I don't. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- If you're herding or pushing out in the field, in the pasture, about a team of how many guys are you? (Jon Fighter – Crow Tribe Bison)
 - One. On Monday, I moved all 4,000 animals by myself in about an hour and a half across 6 miles. It's nothing I do better than anyone else. I take my time. They know what I want them to do; they've done this enough that they understand. I go open all the gates to the other pasture, and then I just slowly go around to the other side. By the time I get back to the gates, they're all in the other pasture. As long as you set yourself up for success and work around the way you know they're going to go, it works real easy. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- What's the average amount of head you work a day? (Ralph Tallbear – Cheyenne & Arapaho Tribe)
 - 300-400. We have one guy running the squeeze, one guy giving shots and doing vet stuff on one side, and I run the back. Our fourth guy is on the computer recording data. Our philosophy is that it's not how many you work in a day; it's how you work them. So, our goal is to do it the right way. Slow is right, and right is fast. Just do that, and it works. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- Do you have an overview like, from your grass traps to your pens to your smaller pens? (Weston Henson – Cherokee Nation)
 - I do not with me, but I can draw it out for you. I'd be happy to sit down with anybody and show you what we did. All the corral work and stuff I did was run through Temple Grandin. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
- You said 18 years of working with bison. You seem to have a very symbiotic relationship with the way you work with them. Can you expand on feeling connected to bison? (Ehakela Cummings – ITBC Intern)
 - I've done a lot of different things. I started working with bison as a volunteer with the Nature Conservancy. From day 1, when I walked in with them, I thought this was what I should have been doing my whole life. I don't know why; that's just how I felt. Only thing I've felt super happy about. I learn from them every day. One of the panelists said to sit out there and watch them. Watch them because they are watching you and learning from you. Go in with that attitude; we are in this together, I'm not going to do anything to hurt you, and you don't do anything to hurt me, and we'll all get along just fine. It seems to work really well. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)

- [Could not hear the question as it was asked before a microphone was provided]
 - We vaccinate in October or November. As a company, we try to do things to help all the smaller producers out. We don't give them anything they don't absolutely need. We have a staff vet. We do fecal samples. We don't worm almost ever, just the calves. If your pastures are in good shape and rotate like you are supposed to. Parasite loads will go up, but the animals know what to eat to take care of that. They self-regulate. Never give antibiotics. Sometimes you have to shoot an animal because it has a problem. You don't want to lose the whole herd. Bison need three things: water, grass, and other bison. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
 - What are the brown spots in the grassy area? (Question from the Zoom chat)
 - We do put mineral out. The bison love it. They tend to devoid the area wherever we put the mineral. We use a block from Redmond; it's made for Bison, similar to the cattle blocks, but with extra trace elements that bison need. We don't salt every pasture, about every second or third. I'll usually put a few blocks out to see. If they leave it alone, I don't give more. If they go nuts on it, I give them more. They regulate what they need, not us. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
 - I'm curious to know about when you let them loose, and they take care of themselves, do you have any plant identifiers of what they are eating more of? For example, the burs that get stuck in their hair. (Arlo Iron Cloud Sr. – Diné and Oglala Lakota Nations)
 - That's American licorice generally, in our end of the world. It's got a high oil content, and they love it. I don't know, but I think it makes their tummy feel better just watching what I see. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
 - We came across some old literature that said they eat the licorice to balance out their gut biome; it's like sunflower seeds for us. I'm curious, is there anything else? (Arlo Iron Cloud Sr. – Diné and Oglala Lakota Nations)
 - I spend a lot of time with the animals and try to watch what they eat. There is some work being done at Nachusa Grasslands where researchers can take hair and do an analysis of what the animals are eating down to the species. The bison do better when they can pick and choose what they are eating. We try to watch our mix between cool and warm season plants. We are trying to restore the land and get biodiversity back into the system. Bison is our biggest tool to do that. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
 - How much does your average cow weigh? (Question from the Zoom chat)
 - Our average cow is about 1,200 pounds. Our big cows get 1,500-1,600 pounds. Our big bulls, something else we've started doing in the last couple of years is we've gone to 2-year-old breeding bulls. No bulls older than that on the ranch. The main reason is genetics, so they aren't breeding their daughters. 2-3 years old is the best time to sell a bull, the highest market value. (Dave Crites – Fawn Lake Ranch, Turner Enterprises)
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Megan Hawkins

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BIOSECURITY AND SAFETY DURING BUFFALO TRANSFERS

Colonization disrupted EVERYTHING in North America in ways that are still manifesting and just beginning to be acknowledged.

Factors that Increase Risk for both herds and Communities

- Diseases impacting buffalo are different and may have been introduced from non-native species.
- Buffalo managed behind fences which changes their gut biome.
- Near-eradication of other natural predators means the sick are not being removed from the herds allowing the spread of diseases.
- Keep buffalo populations isolated from each other and move them suddenly with trucks allowing fast exposure to new diseases.
- Moving is stressful!

Animal Disease Traceability

- Silver tags – National Uniform Eartagging System (NUES); affordable but easily ripped out.
- RFID tags – quarter-sized, readable by a stick reader or scanner; can work with a computer or database to know who's who while in the alley.
- Microchips – injectable, can't be pulled out, can migrate, or be tough to read with thick hair.
- Electronic RFID or chips need to be registered for a Premise ID#.

State Animal Import Regulations

- Every state requires a certificate of veterinary inspection.
- State regulations vary regarding diseases.
- New diseases pop up from time to time that states play around with whether or not they want to include in their regulations.
 - Main ones are tuberculosis and brucellosis.
 - Just because it is regulated doesn't mean it is serious for bison, and just because it isn't regulated doesn't mean it isn't serious for bison.
- No requirements in states you are passing through.
 - Some states recognize Tribal lands are the final destination and don't impose regulations on buffalo passing through the state to Tribal lands.
 - From a herd health perspective, it's good to ask for state import requirements PLUS any your Tribe/Ranch is concerned about.
- Many states vary the classification of buffalo, with some lumping them in with cattle as a domesticated species even though they are a wildlife species.

Common Diseases Spread in Transport or That Prohibit Transport

- Transmitted in Fecal Material:
 - Calf scours – diarrhea caused by multiple pathogens, easily communicable in dirty bedding or trailers
 - Johne's disease – caused by MAP bacteria, very hardy, ZOONOTIC
- Respiratory Diseases:
 - Bovine respiratory disease complex (shipping fever) – certain viruses and lots of bacteria
 - Infectious bovine rhinotracheitis (IBR) – caused by bovine herpesvirus-1, spread by coughing
 - Malignant Catarrhal Fever (MCF) – contact with sheep, even airborne for a few miles, can be dangerous; not transmissible between buffalo

- Spread by multiple methods:
 - *Mycoplasma bovis* – unknown spread, likely through the nose to nose, fluids, and respiratory; contact with cattle or NEW infected buffalo is dangerous; high mortality rate
 - *Mannheimia hemolytica* – coughing, contaminated surfaces, nose-to-nose; upper respiratory, usually antibiotics work
 - Bovine Tuberculosis – very contagious, no treatment, and ZOONOTIC through multiple exposure methods
 - Bovine Viral Diarrhea – spread through multiple body fluids; good blood test for it – test new animals
 - *Histophilus somnii* – bacterial, associated with stress and handling, sudden death common
- No vaccine licensed specifically for buffalo. Vaccines are generally for cattle, and it is assumed they will work the same way. This is not always the case.

Parasites or Vector-borne Diseases

- Anaplasmosis – endemic in some states. Tickborne, may not impact buffalo as strongly as cattle. Low transmission risk from one buffalo to another.
- Bluetongue – endemic in many western states. Spread by biting midges, can be harbored by deer, can be spread.
- Parasites: Ostertagia, Coccidiosis, Liver flukes, Lungworms (ingesting eggs, larva, and inverts from feces)
- Pinkeye (likely *Moroxella bovis*) – can be spread by flies or direct contact. Can cause blindness or eye ruptures.

Other diseases that are not necessarily risks during shipping

- Brucellosis – spread through contact with aborted material and reproductive tissues, very regulated
- Trichomoniasis – never identified in buffalo – STD, some states require a test in bulls
- Zoonotic Diseases – Transmitted between animals and humans
 - Anthrax – naturally occurring in some soils, spread by spores from contact (inhaled, touched, or consumed) with infected carcasses. Often fatal in humans. If suspected in your area, DO NOT touch the carcass, and CALL A VET!
 - Brucellosis – commonly spread through consuming unpasteurized or raw dairy, causes fever, joint pain, fatigue, sometimes long treatment, and recurrence
 - Bovine Tuberculosis – spread through consuming raw dairy, or inhaled or contact with wounds when working with carcasses/hides; can cause Tuberculosis in humans
 - Johne's Disease – causes diarrhea in ruminants, no cure, and often fatal; caused by MAP, same as Crohn's disease in humans
 - E. coli – naturally occurring gut flora, but some strains cause disease. Infection when fecal matter comes in contact with meat that is then undercooked.
 - Rabies – spread through fluids and is highly contagious. Animals acting funny. It impacts every mammal and is usually fatal.

Biosafety Measures to Prevent Risks During Transport

- CLEAN OUT TRAILERS!!!
 - So many diseases spread through poop, snot, or blood
- Boot covers (**can be a slip hazard in trailers**) or boot baths and disinfectants
- If an animal is injured and needs to be euthanized/harvested
 - Use your judgment on PPE or safety measures
 - Animals coming into the herd are most likely APPARENTLY healthy
 - Opening a carcass always increases the risk
- QUARANTINE NEW ANIMALS!!!
 - Watch for coughing, diarrhea, emaciation, lameness
- Practice passive disease surveillance in your herd and work with "sending" locations to develop disease surveillance programs.

Disease surveillance during harvest

- ITBC conducts training on disease surveillance/necropsy during field/cultural harvests.
- Have a kit ready with labeled baggies, swabs, vials, etc.

QUESTIONS:

- New genetics coming in, scared of introducing to the original herd. I talked to the ranchers around, and they were concerned about what the buffalo would bring in, but I was more scared of what the cattle could give them. We have new herd genetics coming in, and I'm going to have them tested before letting them get near. The necropsy trainings are outstanding. We were trying to get more Yellowstone bison into quarantine because of the status of the genetics, but they are more into killing the bison. One more meeting, so there is a slight chance we can get those numbers, but it doesn't look good because it's population control, and the Department of Livestock doesn't want this. (Leroy Stewart – Crow Tribe Bison Management)
 - Yeah, we have a hard time sometimes. A lot of the states and their livestock departments focus on protecting livestock interests in the state, which aren't always compatible with buffalo and the Tribes. There is a lot of cross-over, of course. We are doing a lot of research, and we are trying to get better tests for diseases and procedures if a test is positive. Every single buffalo out there is important, for a million reasons. (Megan Hawkins – ITBC)



Dr. Eric Pulis

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PARASITES IN BISON (INCLUDES DEMO)

What are Parasites?

- Parasites are animals that live at the expense of, in, or on another, usually larger animal.
 - Large infections can be detrimental.
 - Hosts are animals that parasites can infect (inside) or infest (outside).
 - Vectors move pathogens from one host to the next.
- Your vets are thinking about how those animals that live inside or on bison are causing problems for the host.
- I think about how these animals are moving through the landscape to come into contact with each other.
 - In the case of bison, we are going to talk about gastro-intestinal worms, mostly nematodes.
 - Nematode eggs are shed with the feces, undergo a period of development on the ground, go through a couple of sheds, then crawl up on the grass where the bison accidentally ingest them to complete the life cycle.
 - To reduce the worm population, think about how we stop that contact from happening rather than just using a dewormer.
 - Part of that worm's life cycle is on the ground, crawling around, and that is where they come from to infect the next host.
- Parasites often have complex life cycles with aggregated distribution.
 - Most individuals will have few or no parasites, but a few will have many.
 - Hosts differ in contact rates, susceptibility, nutritional status, etc.
- Every Nematode has the same life cycle:
 - Eggs passed from the host
 - Period of development on the ground before hatching that is temperature and wetness dependent.
 - Free living larval stages L1-L3
 - L# designate shedding events where they shed their cuticle to grow in size like a grasshopper.
 - L3 infective larva ingested by a host
 - Need period of development before larva becomes infective.
 - If real hot, it might take a week, if real cool might take a month or more.
 - Larvae mature and reproduce sexually in the host
 - Some species stop reproduction in winter – some can't overwinter in the egg or larval state on the ground.
 - If you want to get down to species, look at copulatory bursa on males. When grabbing samples, get some of the small males, not just the large females, full of eggs.

- Common parasite examples:
 - *Ostertagia* spp.
 - Brown stomach worm
 - L3 larva ingested on forage
 - Develop directly or penetrate abomasum to emerge later
 - Adults in abomasum
 - Egg shape: lobe texture, nice thin shell all the way around
 - Symptoms: loss of appetite, diarrhea, anemia, weight loss, poor coat, mortality
 - Treatment: encysted worms resistant; susceptible to several parasiticides, avermectins/benzimidazoles
 - Idea of using one treatment during one season and using another during a different season, brought up during the panel session, helps reduce the chances of resistant worms.
 - Control: calves have little immunity but good to have a couple for acquired immunity, pasture rotation, good nutrition
 - Best in cool, moist weather, overwinter in freezing, poorly in warm, dry
 - *Haemonchus* spp.
 - Barber's pole worm
 - In abomasum – blood feeder
 - L3 larvae infective
 - Symptoms: loss of appetite, diarrhea, anemia, weight loss, poor coat, mortality
 - Treatment: susceptible to several parasiticides, avermectins/benzimidazoles, resistance common
 - Control: Freezing and dry conditions, pasture rotation, good nutrition
 - *Cooperia* spp.
 - Eggs: Can see larval starting to form
 - Use the shape and nature of what is inside to identify better
 - Symptoms – loss of appetite, can be calf mortality, worse in conjunction with other species
 - Treatment – not often needed, susceptible to several parasiticides benzimidazoles, some resistance
 - Control – pasture rotation, good nutrition, larva dormant during winter (can overwinter)
 - Best in warm, moist weather; minimal in cool/freezing; a little better in dry
 - *Dictyocaulus* spp.
 - Lungworm
 - Hatch internally
 - Because larvae are ingested again, you can do pathology when they are burrowing through to the lungs
 - Symptoms: bronchitis, verminous pneumonia, nasal discharge, weight loss, fever
 - Treatment: encysted worms resistant; susceptible to several parasiticides ivermectin/levamisoles
 - Control: young have little immunity, vaccination, pasture rotation
 - Liver fluke
 - *Fasciola hepatica*
 - Complex life cycle
 - Liver and intestinal damage while migrating
 - Adults can damage the liver
 - Red water
 - Control: Seasonal treatment, snail control, herd management
- Consider the parasite's free-living stage for control.
 - Pasture rotation, if you can move when larvae are on the ground, nothing lives forever.
- Better able to detect some of the diseases born by ticks.
 - Main ticks we need to worry about are those that have more than one host for infecting the next batch.

Fecal Float Demo

- Bison fecal samples collected – put in the fridge right away to keep eggs from hatching.
 - Worms are harder to identify than an egg shape.
 - Generally, we can't get to species with egg shape but can narrow it down.
- Switch out gloves often to avoid getting feces on everything.
- Fecal smear:
 - Use a dental pic, and slosh it around in the feces.
 - Smear a thin layer onto a slide.
 - Put under a microscope and scan for eggs or larva.
 - Did not find anything in this demo.
 - Chances of finding individual eggs or quantifying from this alone are slim (think about how much a bison poops a day).
- Fecal Float (works for finding eggs in feces):
 - Better for quantifying – get an estimate of how many eggs per gram of feces.
 - Take about a gram or two from each sample and combine in a vial.
 - Add float solution.
 - Eggs will float up into the solution making it easier to see what is in the feces instead of going one small slide at a time.
 - Works best with a centrifuge but can be shaken too.
 - Pour into vials or test tubes so the meniscus is right at/just over the top, and put a slide on top.
 - Let sit for a period of time.
- For finding things like lungworms that are shed as first-stage larvae instead of as eggs:
 - Take a container.
 - Add a decent size sample and let it strain through.
 - Ideally, with a funnel with a little tube on the end.
 - Add saline right up to the bottom of the strainer and stir it up.
 - Leave it overnight (8-12 hours) and check first thing in the morning.
 - Decant off the top, be careful not to disturb the very bottom layer.
 - The slurry on the bottom is where they will be swimming. Use a pipet to make a slide and examine it.
- Ideally, we would leave things longer than we did in this demo.
 - For float solution – like sugar solution because it doesn't crystalize as badly as the salt or zinc ones, but it does make things very sticky.
 - Found one egg in the fecal float (people in the room went up to take a look as we could not project it onto the screen).
 - Little oval, filled all the way to the eggshell.
 - Could use molecular methods to identify or hatch them out, and watch them grow a bit (time it out from hatch through sheds).
 - Couple of genera it could be, but you can eliminate a lot of species with just that image/description.
 - No larval nematodes.

QUESTIONS

- What to look for on *Haemonchus* in the necropsy? (Question from the Zoom chat)
 - Main thing when peeling open the stomach, look for little patches of bruising. If there are only one or two, they will be really hard to find. If there are a lot, it will look like little threads. Feel it. Usually, the stomach lining feels smooth and not at all granular. If it does feel granular, that's old attachment sites or the young worms that are maturing and recently moved. Get a sample, even better if there is a worm attached, for the vet to do histology. (Eric Pulis – Northern State University)
- Which part of the stomach? (Question from the Zoom chat)
 - Usually, the abomasum. The abomasum to the first couple of feet of the small intestine is usually where the best nutrition is for any worm you are looking for. Usually, anything in the colon is pretty benign and less likely to cause pathology and problem. Just as a generalization, best to check the whole thing. (Eric Pulis – Northern State University)
- What is your formula for sugar to water? (Question from the Zoom chat)
 - For today, I just made feeder solution. I think it's 335 mL of water, 455 g of sugar, and a couple of mL of formalin to keep it from getting fungus and mold in it. It doesn't last long, but I like that one because you can make it up really quick, and sugar is cheap, and so is water. Some of the other ones are harder to get ahold of the ingredients. Some people vary the density, especially if looking for a particular worm. Just use Google if you want to try other ones. (Eric Pulis – Northern State University)
- For the three test tubes, are those all different samples? (Question from the Zoom chat)
 - No, I just took all of them together and shook them up in one tube. Ideally, I'd have a centrifuge, put a capped tube in there, and spin it down to get the eggs to the top. (Eric Pulis – Northern State University)
- How many samples do you want to take in order to get a general parasite composition in a whole herd? What would a ratio be? (Brady Badwound – ITBC Intern)
 - If you are trying to generally start, 10 is always a good number, but bigger numbers are always better. Unfortunately, it's always going to depend on prevalence (the percentage of animals in a herd that are actually infected) and intensity (the number of parasites per animal). If prevalence and intensity are low, you will have to sample a lot more to get an accurate picture, and with the aggregated distribution, you might need as many as 50 or more. Probably 10-30 would be a good start to give you an idea of what prevalence and intensity look like. (Eric Pulis – Northern State University)
- Question about pasture rotation and actually having infectives on the ground. [Could not hear the question as it was asked before a microphone was provided, repeated by Eric]
 - One of the things you can do is go around the old bison patties, one that's been laying there for whatever species you think you are working with; it takes about a couple of weeks. Take the grass right around there and shake it off into a petri dish with a little saline or water in it. Count how many are in there. But nematodes are hard to tell apart in their larval stages and separate them from just free-living nematodes. I wouldn't recommend just going off that unless you know you have problems; otherwise, you might be just counting free-living nematodes that have nothing to do with your herd at all. (Eric Pulis – Northern State University)
- [Could not hear the question as it was asked before a microphone was provided]
 - You can do it right from this stage. If I really wanted to know exactly what these things were, I'd just do a quick PCR and standard sequencing. (Eric Pulis – Northern State University)
- [Could not hear the question as it was asked before a microphone was provided]
 - Generally, if you get infected in the spring, a lot of those will be dead in a couple of months, species variable. If they don't pick them up until fall, they will overwinter and not produce eggs until spring. They have a set life span, a couple of months usually. (Eric Pulis – Northern State University)
- You can take a picture through the scope with your phone and text it to your vet or someone who knows about parasites; that way, you don't need to try to keep the slide (Mystrera Samuelson – UNMC, CS-CASH)

- [Could not hear the question as it was asked before a microphone was provided] (Jesse Lasater – Southern Ute Tribe)
 - Liver fluke, get to the Rockies there are some, but not right in the northern plains. They have another complicated life cycle that goes snail, aquatic vegetation, something with hooves, maybe you if you're eating stuff at the water's edge. We just don't seem to have the right snail intermediate host in this part of the world to have that particular worm. (Eric Pulis – Northern State University)
- So, the question was just liver flukes. I'm from Colorado, and where we process our bison, they condemn a lot of livers because it's got liver flukes, and it sounds like it's not just our herd; there are several herds that go in there. So, I was just asking him what the red water was, and he mentioned that it was red urine coming out. And then my next question was, what's the best way to limit the loss that we have ultimately because we do have one to two animals that die every year from it? We do worm, but we have to get specific meds for the liver flukes, so that's kind of difficult too. (Jesse Lasater – Southern Ute Tribe)
 - And if it's not a long-lasting anti-helminthic, they can pick it up again the next day. (Eric Pulis – Northern State University)
 - That one's tough because it goes through a snail. The infective stage leaves the snail and cysts on the vegetation, and then the animal, whether an elk or a bison or a deer, comes and nibbles it down, and that little cyst is on the vegetation. So, if you can keep them away from all the riparian areas that happen to have that snail, that'll do it, but that's usually not realistic at all. We know how to kill snails really well, but it also kills every other thing in that wetland. So, we don't usually like to do that either. Probably your best bet is to hope for a good drought that changes the snail diversity wherever that foci of infection is so that it's not there. And then, hopefully, none of your animals are carriers when the water comes back to reintroduce it again. But in Colorado, you also have deer and elk that can also be reservoir hosts, moving it around the landscape. (Eric Pulis – Northern State University)
- Would seasonal irrigation be a problematic spot? (Jesse Lasater – Southern Ute Tribe)
 - If there is enough water. The snails that are hosting that particular worm are aquatic snails, so it's got to be standing water for a period of time. I don't recall how long the liver flukes take from the time they pick up the snails to when they are being shed encyst on the vegetation, but it's a good amount of time, like a month or two or three. (Eric Pulis – Northern State University)
 - I think Ivermectin Plus. You need to treat early because once they get established, the adults aren't very sensitive to it, and by then, the damage is mostly done. So, you need to do it at the beginning of that season. (Mike Hildreth – SDSU Science Department)
- Are any of these parasites zoonotic? (Brady Badwound – ITBC Intern)
 - A little bit, there are a couple of scattered records here and there from people, but we usually don't find ourselves eating enough grass in pastures that it would get you even a clinical. A lot of these things, they *could* infect us, but they might not be able to mature and produce eggs or viable young, so you'd just have a couple crawling around. (Eric Pulis – Northern State University)



Dr. Edwin Brokesh

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EQUIPMENT DESIGN & SAFETY

Designs based on cattle but modified to work with bison

Facility Basics

- Things to think about first
 - Start by thinking about a systems approach to bison production:
 - What is the end goal?
 - How and where will you care for the animals (all seasons, all needs, all purposes)?
 - What resources do you currently have or plan on using (land buildings, equipment, help, etc.)?
 - Make your working facility easy on yourself (no slopes, conveniently located, arrange it to save yourself steps).
 - Be honest about existing fences, buildings, equipment.
 - Don't invest serious dollars in something that should be scrapped.
 - Leave room for expansion (good things grow).
- Safety for yourself and your animals
 - Walking surfaces
 - Use concrete or other all-weather surfaces.
 - Be conscious of and remove tripping hazards and fill in holes.
 - Keep the area well drained.
 - Sharp corners, rib crackers, and headbangers
 - Look for and eliminate these.
 - When you find a new one, note and eliminate it as soon as possible.
- Plan your facilities so that you WILL NOT be in with your animals
 - Catwalks and safe areas
 - Automatic or friction latches
 - Rope-controlled gates
 - Other conveniences that keep you out of the animal pens/alleyways.

Sound and Light

- Animals are scared by loud sounds.
 - Steel tends to be loud when struck – think about deadening materials, especially in high-stress locations.
- Animals need to see where they are going.
 - They like to see where they are putting their feet. Going up is easier than down.
 - Light in the ally is good, shadows are bad.

Fencing Gates, Alleyways

- Binding materials are desirable (sheet steel, wood sheeting, tarps, etc.)
 - Attempting to create an illusion of a monolithic structure.
 - Tall and blind, looks intimidating.
 - Animal will think twice about trying it, but it still needs to be strong.
 - Light where you want animals to go (escape or path forward).
- Use curves or angles wherever possible.
 - Gates form a natural angle to the pen.
 - Animals cannot knock past gates easily.
- Keep distractions outside the alley to a minimum (noises, people, etc.)
- Wherever you pressure animals, fencing should be taller.
 - Use steel in high stress areas.

Crowding Tubs

- Use a friction latch to advance and hold the gate.
 - Cleats inside tub for positive latch points.
- Exit to alleyway must be visible.
- Use rope controls.
- Catwalks outside tub for convenience.

Bud Boxes

- Don't really have an opinion.
 - Not sure how they would work with bison.
- Personally, would set up to stay out of the pen with animals.

Working Alleyways

- Construction:
 - Sheetmetal blinding material.
 - Headache rack over the alleyway.
- Adjustable in width:
 - 28" max width, 15-18" min width – Adjust to fit animals to prevent animals from turning around.
- Horizontal sliding gate to separate sections.
 - Match alleyway material.
 - Make sure gates can latch closed.
- Should be equipped with catwalks.
- Some indication that bison move better side by side.
 - Double alleyway with some visibility between alleys can be helpful.
 - Still need outside blinding materials.
 - Need headache rack to prevent jumping out.
 - Slide gates between sections.

Working Chutes

- Larger cattle working chutes are the right size but require some modifications.
- Need a crash cage with a light opening in it.
- Totally enclosed with sheet steel – only large open area should be straight ahead.
- A good quality, dependable headgate.
- Rear sliding door that matches the alleyway.
 - Sliding doors ahead and behind – animal hits the door at the wrong time, and it will crush you.
- Controls must act fast.
- Convenient to operate.
- Add in sound-deadening materials (rubber floor, padding, rubber under latches, etc.)
- Operator safety:
 - Look for pinch points, headbangers, shin skimmers, sharp edges, etc.
 - Have adequate space around your chute to work.

Crash Cage

- Vertical bar light section at bison eye height.
 - Creates an illusion of escape.
 - Pad bars to prevent boxer cuts.
- Slanted bottom portions – animals slide back into the squeeze part of the chute.
- Slanted top desirable – less space for them to be in.
- Must pivot out of the way. Both directions are ideal – It can be used to close off the area when the animal is released.
- Like to spring load the cage.

Squeeze area

- Totally enclosed with sheet steel – Only large opening should be straight ahead.
- Some light from the side is acceptable, but none is better.
- Rubberized flooring ideal:
 - Better footing for animal.
 - Quieter working.
- Spring release may be necessary – heavier doors are harder to operate.

Loading chutes

- A ramp that fits the height of a trailer.
- Slope no more than 3.5" per foot.
- Cleats or steps for tractions.
- Animals will climb a slope more readily.
 - Going down is harder for them to see.

QUESTIONS:

- I had a question regarding the rubber floors in the squeeze. What type of material are you using if you're going to retrofit an older chute, and how do you attach it? (Jesse Lasater – Southern Ute Tribe)
 - There are a number of different products out there. I was using Rumber. It's a rubber board you'd find in the trailer industry. Quite often, trailer companies have it available to them. There is another product similar to a stress mat; it's large chunks that you can cut to fit. As far as fixing it in place, it's more of a case that you would capture it. What we would do was create a frame, drop our pieces of material in there, and then lay an angle iron over the ends and cross pieces over the top of it to hold it in place. You wouldn't necessarily bolt it down to secure it because if the sun is shining, it will expand and contract, and a bolt, over time, will fracture and break loose. (Edwin Brokesh – Kansas State University)
- Over the winter, I modified our existing system, and the problem I'm seeing right now with our summer months down in Oklahoma is the metal expanded, and my latches aren't closing. What did you do to adjust? I know it probably takes years of figuring, but do you have a general measurement? I've tried several different things. (Ralph Tallbear – Cheyenne & Arapaho Tribe)
 - I don't have a good answer for you. That's probably a case where the latch was just barely working to begin with. You will need to go back and redesign it and work on getting it to work in more temperature ranges as well as rust and water. Make sure you have good drainage out of your latch, so water doesn't fill up in there and rust it shut. One thing I would recommend, spend some time and money improving your pivot points; put a bushing in there so you have a large bearing area in there for your pivot points. It's worth your time to spend money on a good latch. (Edwin Brokesh – Kansas State University)
- I understand that about the latches, and we actually moved to slam latches on all our high-pressure areas. What hinge system do you recommend? I use a ring and collar. I see some that go together with a ball bearing in there. What do you recommend on your systems? (Ralph Tallbear – Cheyenne & Arapaho Tribe)
 - The two latches I like, one that had a spring-loaded deadbolt, so you had a pin going into a solid thing. The other thing we used was rubber on the inside of the frame. We had a metal pipe structure with a rubber conveyor belting with a fairly rough surface that would slide along inside the face of the crowding tub, and it would latch at any point within the crowding tub if there was no manure in there. We added cleats in there as well, so if you hit a patch of manure and it started to slide, it would hit a spot where it would latch up firm. You would have springs there that held it tight against the base of the crowding tub to create the friction so it would latch on fresh paint or old rusty steel. You had to have points where if the rubber was slipping, there would be a spot where it would definitely stop. (Edwin Brokesh – Kansas State University)

GROUP DISCUSSION: TAILGATE TRAINING REFINEMENT & PROJECT INPUT

Facilitated by: Kelsey Irvine, CS-CASH

How can we update the training manual to highlight indigenous excellence and management and include culturally appropriate content?

The *Bison Handler Tailgate Training Safety Manual* was first put together for a broader audience, tailored to anyone who might handle bison. As part of this grant renewal, we would like to refine it and tailor it to our Tribal friends who use this manual.

In an effort to begin this process, a consensus workshop was led by Kelsey Irvine to brainstorm ideas on how we can make the training manual a little more culturally appropriate. We asked the question, “How can we update the training manual to highlight indigenous excellence and management and include culturally appropriate content?” We don’t have these answers, so we are asking you.

To start people thinking, Kelsey asked, “What do you think of first when I say the words ‘Indigenous excellence’ and ‘culturally appropriate’?” Responses from the room included Indigenous knowledge, sustainability, and heritage. Next Kelsey asked, “When we think of these words and the current manual, where is more work needed?” Responses from the room included health conditions that people should know about, acknowledgement of the historic connection in the introduction, and alternatives to some of the practices if it is something people are uncomfortable with culturally.

Participants were encouraged to write down ten practical ways we can update the training manual and to discuss their ideas at the tables. Each table was asked to write down up to nine ideas that could be put on a board for discussion. These ideas were grouped into new topics/sections that will be included in the updated manual; some suggestions pertained to the look as opposed to content to be added.

Due to time constraints, these sections were not labeled at the time. Kelsey later added labels which are included along with the topics in the table on the next page. Other topics that were mentioned but not categorized include: helicopter safety, field dressing safety, personal (temporary) training and clothing, recommendations on handling equipment, recommendations on safe transport of animals, and hot weather topic for people and bison. If you have ideas for section labels, additional items, or if you would like to review parts or all of the updated manual as it is ready, please reach out to Kelsey at kepalm@unmc.edu.



Updated Visuals and Resources	Modifications based on herd size, purpose, and goals	Inclusion of commercial & traditional harvest protocols	Incorporation of cultural and historical context	Additional topics: health and safety for workers and bison	Safe facility design & low-stress animal handling	Overall indigenous design of manual
More photos, less text for examples	Understanding the purpose/goals of the herd (attitude of working a herd for financial gain vs. cultural experience would be different)	Commercial vs. traditional harvest protocols	Inclusion of cultural acknowledgement	Add topic: Biosecurity/disease monitoring &/or testing	Facility design & use	Indigenous Images
Laminated booklet		Include traditional protocols	Recognition		Safety more on the animals than the people (keeping the animals safe keeps the people safe)	Design – add more traditional designs
More visuals			Ceremony/prayer as aspect of bison work	Less people = less stress for animals		
Videos of “proper” handling (digital copy)	Herd size accommodations		Cultural stories as teaching strategies	Just “review” section (review section that contains enough for a true “tailgate training”		
Include educational resources			Understanding of Tribe’s spiritual connection	Safety checklist		
			Historical context among different Tribes	Common sense approaches		
			Contacting Tribes to gather info	Topic: PPE Reword the section – address long hair and braids		
				Flexibility and positive attitude (going into it with the right attitude)		
				Add Topic: Field harvests (both emergency and planned)		

CEREMONY AT BUFFALO RANCH AND DEMONSTRATION HARVEST AT COMMUNITY CENTER

Ceremony Hosted by Flandreau Santee Sioux Tribe

Demonstration Harvest led by Arlo Iron Cloud Sr. (Diné and Oglala Lakota Nations) and Lisa Iron Cloud (Oglala Lakota)

The Flandreau Santee Sioux Tribe graciously welcomed our team and meeting participants to witness and learn from the ceremonial harvest of a member of their herd. This included blessings prior to and following the sacrifice, as well as the opportunity to pay respect following the ceremony. Arlo Iron Cloud Sr. demonstrated how to remove the head using only a knife. He gathered some of the blood and explained that this was the life essence of the buffalo, which can be shared with the people in this way.

ITBC's mobile harvest trailer was employed to hoist and secure the buffalo in the refrigerated trailer, before being transported back to the Flandreau Community Center for further harvest, which was led by Lisa Iron Cloud and members of the community. Tarps were laid out, and people were encouraged to join in the harvest and share their methods as well as their stories and traditions. Megan Hawkins demonstrated the use of the ITBC-provided necropsy kit to collect samples which allow for health assessments to be conducted, as well as guidance on how to visually and manually inspect organs for signs of disease.

"We are all in this together. We are all learning together." - Arlo Iron Cloud Sr. (Diné and Oglala Lakota Nations)

