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A PRODUCERS PERSPECTIVE ON REPRODUCTIVE TECHNOLOGIES

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INTRODUCTION

My name is Chad Blair and along with my, dad Ed, uncle Rich, cousin Britton, and our wives, we operate Blair Brothers Angus Ranch in western South Dakota. Currently we run around 1200 cows and 400 to 500 replacement heifers that all get Aled over two cycles. We also market between 350 and 500 yearling bulls each year that are sold private treaty off the place. We run around 2000 head of yearling cattle that include steers out of our bulls and purchased replacement heifers out of our bulls that will be resold to other customers. We do all of our own calving, Aling, ultrasounding and other cattle work.

I was asked to give a producer perspective on reproductive technologies, so I am going to explain some of the technologies that we have tried and still use, and some that we have tried and no longer use, either because something better came along or it just didn't work well for us. I will start with a timeline on Aling and work into other technologies that make our business operate smoothly.

HEIFERS

In the mid eighties we couldn't find bulls to breed our hfrs to that did what we wanted them to do. In response we started Aling hfrs using a MGA protocol. This was great and allowed us to get our hfrs bred in a timely manner to bulls that calved easily. The result was calves that were ultimately useable instead of what was historically a calf that was smaller and not as desirable as calves that were out of older cows. The goal at that time was to raise replacements out of our heifers.

When CIDR's came out we tried them on our hfrs. By this time we had noticed inconsistant results with MGA. We had been hand feeding it as a dry pellet, and as we started to run more hfrs and mixing it with a mixer wagon it seemed that we were not getting the response we once were with MGA. It may have worked better as a liquid feed but we are not set up to feed it so we went with the CIDR

The first year we used CIDR's on hfrs we had a 99% response and a pretty remarkable conception rate. We thought WOW, this was the answer we had been looking for. I should say that throughout all of this we were heat detecting and breeding on heats, not time breeding.

We used a 7 day CIDR, heat detect then time breed protocol for a few years. We would AI one cycle, then turned out clean up bulls. With this protocol we were getting a 55 to 60% conception rate with AI and running 20 to 25% opens. Then around 2002 we were in a drought and didn't have pasture to turn hfrs out on so we kept them in the drylot most of the summer. We noticed that around 18 days after injecting those heifers with prostaglandin they started coming back into heat fairly tightly. This taught us two things; 1) we had never had enough bulls turned out with those hfrs for clean ups, and 2) we could heat detect and AI this second cycle without much labor.

From then on we have heat detected and bred second cycles. We now use a fourteen day CIDR protocol with heat detection and then time breed at 70 hours. This we believe bunches the second cycle tighter and allows us to breed between 20 and 30% of the hfrs a second time and results in another 15% of heifers stuck overall to AI. We now conceive between 70 and 77% of them AI in 28 days.

I shoud mention that we use Kamar heat detection aids when breeding first cycle. We do not use them on second cycle breeding, simply because we don't want to run them through the chute an extra time to apply the Kamar. Second cycle heat detection on heifers takes about ten days and is fairly easy to do with our hfrs still in the lot.

COWS

When we started Aling cows in the early 90's there were not may options for synchronization protocols (at least not any we really wanted to use). We heat detected and picked up natural heats for twenty-five days. This was time consuming and tedious. At this time we were only breeding around 300 cows AI and would ride out and sort hot cows as they came into heat.

Our Select Sires representative got us to try the Select Synch protocol in 2003. This is a GnRH shot followed by a prostaglandin shot a week later. This protocol worked great, and still does, but we needed to start heat detecting three days after the GnRH shot to ensure we identified all the cows in heat. After a few years of synchronizing this samller group of cows we decided we would synchronize and AI all of our cows.

We switched to using CIDR's in cows in 2006. This has allowed us to breed multiple groups of cows using a 7-day heat detect and time breed protocol on all of our larger groups of cows. Recently we started using some strictly time breed protocols on some smaller groups of cows just to get everything bred in a timely manner with the limited labor that we have.

The protocol we use on cows is a 7-day CIDR heat detect then time AI. With wet two's, at 36 hrs after the prostaglandin shot we will generally pull 40 to 50% to breed, then at 48 hrs we will pull around 20% and then at 70 hrs we will time breed the remaining cows. With older cows they will come in a little slower. We will pull the biggest percentage of them at 48 hours. All the cows we breed in the last pull will get a GnRH shot according to the protocol. We have consistently been able to stick 40 to 50% of these non-responding cows when we time breed them. The use of CIDR's allows us to set up multiple groups of cows in the same week, without missing cows that are in heat thus

stacking breedings. Whereas the Select Synch protocal required us to heat detect prior to the prostaglandin shot.

Three to four days after the time breeding day we will turn out clean up bulls. Nineteen days after the prostaglandin shot we will pull those bulls and start heat detecting again, for about seven days. Again, just like in the hfrs, these cows that did not stick on the first round of AI will come back in a pretty tight group. We will pull around 20% of the cows and breed them resulting in 77% to 87% of the group of cows AI bred in 25 days.

This is what synchronization of cows has done for us. With the use of synchronization, we can now breed 3.5 times the amount of cows we were compared with pulling natural heats. We bred all of our groups of cows through two cycles within 35 days this year. This is huge for us to be able to breed more cows in ten more days, than it took to breed a quarter of them, all while using the same labor force.

ULTRASOUND

We got started ultrasounding heifers in the 90's. The SDSU Beef Specialist in Rapid City was doing ultrasound at the time. After he moved on to another job, we decided to buy our own machine and learn the technique. These first machines were basically used machines out of hospitals. They were not made to be chute side and did not last very long. They were also pretty expensive. We went through several machines like these.

Now there are several companies making ultrasound machines for veterinarian use. We purchased an Ibex Pro and have been happy with it. It is dust and water-resistant and runs off batteries. The great thing about battery operation is that we can go set up portable corrals and preg test anytime and anywhere. This is important to me because I like to preg test when the first cycle calves are between 100 and 110 days. This is as about as old as these fetuses can get before they drop over the pelvic wall and become much harder to identify the exact age. This also puts the second cycle fetuses in that 80 day range which is easy to identify. One of the other reasons I like to test at this time is we turn out clean up bulls in between AI cycles. There will be around three percent of cows that will short cycle and the bulls will breed. If not for ultrasound, I could not identify these calves and they would be considered AI calves.

We preg test our heifers in August and pull the opens off the day that we ultrasound. This allows us to send these heifers to Kansas to feed and hit a harvest date in December when typically the choice select spread is the widest.

We will typically preg our cows in September when we give the calves pre-weaning shots. We use a hair dye to mark the cows for calving dates. I do not mark the first cycle AI cows, I mark the cows bred in-between over the withers and second cycles on the shoulder. Then the bull breds get marked on the rib and on the hip for April and May calvers respectively. We also mark the opens over the tail head. These marks last until the cows shed off in late spring. These marks are actually a reproductive technology that makes life easier, we can sort calving groups before calving without having to read ear tags coming down an alley.

At weaning time we sort off the opens and bull bred cows that will be sold. I will retest the opens and typically pick up some late calvers, as we usually don't pull bulls until we preg test the first time. With the use of ultrasound we can identify these late May and early June calvers and market them as bred cows instead of weigh-ups. Thus adding a lot of value.

Our typical operating procedure is to sell all of our bull-bred cows and keep all cows that stick AI. With the use of ultrasound a month or so before weaning we can start making a plan on how to market those cows desingated for sale and determine how many cows are going to be in each calving group.

CALVING

I often get the question if you breed all your cows in one or two days will they calve in one or two days. The simple answer is no. It has been my experience from calving synchronized heifers and cows for two decades that a synchronized group of heifers will calve for 22 days and a synchronized group of cows will calve for 32 days. Of course we have calved out one cycle in as little as 18 days on heifers and 20 days on cows. We have had some big days. Our largest day was 65 calves in a twenty-four hour period with over 300 calves in a week and over 400 in ten days.

We have used shorter gestation genetics since we started Aling and have shortened the gestation period of our cowherd by a few days. Our heifers will start calving around 265 days with the peak of calving falling around 278 days of gestation. Between 273 and 283 days of gestation 83% will have calved.
Our cows will calve at a similar way with the peak coming at 279 days and 75% being calved out over the same ten-day period. As you can see cows seem to stretch out a little more than heifers.

Cows will calve in a bell curve with a few calves at the beginning and a few calves at the end with the majority in between. So the question I get a lot is how many calves will we expect to have in a day. The most we have had in one day is 17% of the group. But at the peak of calving our cows will average 10% in a 24-hour period. So for example if you synchronized 100 hd of cows and stuck 75 of them in the first cycle you could expect to have 7 or 8 calves in the peak 24 hour period. This is not a hard and fast rule but a guideline I use in figuring how many cows I want to calve in one place.

Heifers for some reason will run a bit higher. I have had a peak of 16.6% calve in one 24-hour period, but they average 12% at the peak. So with 100 head of first cycle heifers, you will get around 12 calves in a twenty-four hour period.

People are usually curious on how we calve heifers in northwest South Dakota in February. I have evolved over the years on our calving protocols on heifers. What we do now is run them in a stockade and feed them a balanced ration. At dark we run them into some smaller pens, right next to the barns. I will check them once an hour and run them into the barns in jockey pens that are 14 foot by 14 foot. My goal is to have all of our heifers calve in the barns. This seems to work the best for us for allowing these first calf heifers to pair up and get their calves going. Typically we will leave these pairs in the barn for six to twelve hours, if we can. When they are really calving some are only in the

barn for a few hours. We will calve with three people, I do the night calving and my wife and cousin do the morning and most of the day. In the morning we will kick pairs out of the barn into pens that hold around 30 pairs. Then we will kick them out to pastures in groups of around 200 pairs.

We will start feeding these pairs on pasture a balanced ration including mineral a month before they start calving, up until the middle of April, with a projected average daily gain of .7 lbs per day. From then until we go to grass with them we will feed them a mix of alfalfa and grass hay. We will take these pairs to grass around the tenth of May.

Before we started feeding these heifers a balanced ration we would expect to get around 50% of them to breed back as three year olds. Now with proper nutrion and a slightly longer post partum interval we get 65% of them to breed back in the first cycle and another 10% of them to breed in the second cycle.

We calve the heifers in February and the cows in March and April. Depending on the weather and which ranch these cows are on we will either calve them in small pastures and kick pairs out every day or calve in larger pastures and move the heavies on in a week to ten days depending on how many there is to calve in each particular group

Unlike heifers we generally don't check cows 24 hours a day. Depending on the weather and how many cows are in one group, we will start checking early in the morning up until ten or midnight. If the weather is good the only reason I will check all night is to tag and weigh calves, just to keep up during the peak of calving.

So what if you're in the swing of calving and get a blizzard? This is where figuring how many cows to calve in one particular place comes into effect. This is where I use my average amount of calves' percentage. If you know to expect around 10% of cows to calve in a 24 hour period then you can figure how many synchronized cows you can calve in your facilities. This is one of the things that synchronizing cows does for me, is allows me to know how many calves and when I am going to have them.

The advantages to us in calving synchronized cows are numerous., Having large groups of calves all born in a short amount of time limits the amount of labor we have to hire. This allows us to calve a large group of heifers and then move onto first cycle cows and then second cycle cows, without having to travel between places as often as if they were all calving at the same time. It is nice for us that when they start calving they are continually calving without slowing down or stopping for a period of time. There is always a calf to tag every time you go check them, this keeps us from becoming complacent. Another advantage is that we can have large groups of pairs that the calves are all the same age. This allows for branding time and weaning time shots to be administered in a timely fashion and knowing that these shots are given at the correct time to set the calves up for a healthy start. A final advantage is that when we are setting the cows up to breed they have had a long enough post-partum interval that synchronization response and ultimate breed up is very good.

It seems that I have talked a lot about calving but I think this is one of the more overlooked aspects of synchronizing cows.

EMBRYO TRANSFER

Another reproductive technology that we have used is embryo transfer. Ten years ago we started flushing cows in the hopes of increasing numbers. At first my brother in law and I went to an embryo school in Kansas and came home to start flushing cows. We flushed 25 to 30 cows every 60 days and froze embryos all year round.

This process involves synchronizing the donor cow and then super ovulating her with a FSH shot twice a day for five days. There are numerous protocols for setting up a donor cow, but they are all very labor intensive and difficult to do while trying to get other ranch work done.

In the spring we would synchronize both purchased and customer heifers to implant embryos into. We did this for quite a few years and never had a lot of success. The heifers would only stick with an embryo about 25% to 35% of the time, and the calves out of some of the purchased heifers were undesirable because they didn't produce enough milk.

One of the things that really bothered me about this system was that once we took these top percentile cows for desirable traits out of the herd and flushed them for a year it was hard to get them to acclimate back into the herd; they were too fat to breed back. Without much success in this system we had a nationally known firm come in the spring and would do a fresh flush on 60 or so cows and place these embryos in heifers and cows that were far enough post partum. We found slightly better success with this method. One other thing we tried with embryo transfer was to put embryos in a fall calving herd. This worked marginally as well.

Our goals for embryo transfer did not align with the results that we received. I know there are ranches out there making embryo transfer work for them but we could not. To expand numbers we have had success keeping more heifers to breed and Aling second cycles longer.

This year we used a different technology, in vitro fertilization (IVF). This is a technique, that involves removing an unfertilized egg from a donor cow and fertilizing it in the lab. Then the embryo is grown until the optimal time for freezing. The embryo is frozen then stored until the recipient cow is ready.

I implanted some of these embryos into mixed aged cows this spring and have had success similar to the collected embryos. I have not done enough numbers of these type of embryos yet to give any good percentages of conception rates. Some of the real advantages of IVF vs. embryo collection from my standpoint are that there is a lot less labor on the rancher side with IVF. Not having to set up donor cows saves me a lot of time. Donor cows for IVF do not have to be treated any different then her contemporaries, we just sorted them off and brought them in for a one-day session. These cows were able to breed right back into the herd at the normal time she would have been.

It seems that embryo transfer is a great tool to use if your trying to expand on specific unilateral genetics. It is a costly and time-consuming technology that is difficult to expand population genetics, which is our current goal.

In conclusion, there are numerous reproductive technologies that are available today. I hope I have conveyed that we are an operation that is willing to try new things but ultimatley the technologies that we use are the ones that are most cost effective and labor friendly for our operation. Through AI we have transitioned from a commercial herd just trying to breed better replacement heifers to a seedstock operation that is ranked in the top 30 in the nation for number of bulls marketed each year.

The reporductive technologies that we have evolved to rely on have allowed us to expand numbers and increase the value of our cattle. Everything we use from AI to ultrasound and IVF adds value to our cattle. This has allowed my cousin and I to come home to the ranch and succeed. If not for the technology that we use we would not have been able to expand our business and thrive.

NOTES