Range Beef Cow Symposium   Animal Science Department

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Integrating Information Into Selection

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Quinn Cow Company

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Integration*: To make into a whole by bringing all parts together*.

As ranchers we intuitively know the unique resources that make up the whole of our operations and use these resources to cost effectively produce a product. Ranch resources can be simply categorized into forage, genetics and people and the rancher's commitment to good management practices. Add to that, information or knowledge management, management of relationships and, of course, managing for the end product. The glue that holds these parts together is the rancher-- the heart, the passion of the operation.

Range cattle management must be based on relating forage quality and quantity to meet the nutrient requirements of the animal for a given level of production. In order to be cost effective it is important that the forage base will optimally express the genetic potential of the cowherd, ideally, only utilizing limited strategic supplemental or harvested feed. A very necessary part of enhancing the whole is the manipulation (*defined: to operate with skilled use*) of the parts. The purpose of this paper is to discuss how we have manipulated or utilized genetic selection as we endeavor to strengthen the whole.

To briefly describe our operation, we are located on the southwest corner of Shannon County, South Dakota on the Pine Ridge Indian Reservation. The range is predominantly clay range sites with a mixture of warm and cool season grasses. The grass cures well on the stem and serves as excellent winter pasture. There is an abundance of winter protection in the form of trees and canyons. The geographic lay of the land, together with the prairie wind, generally insures adequate grazing even in winters with heavy snow fall. Our cow herd is comprised of Angus-Simmental cross cows. We strive to produce a cow with high output and relatively low inputs in the way of harvested forage. We evolved from a two-way rotation back cross using registered bulls of each breed which we still use in our artificial insemination (AI) program to Angus-Simmental base bulls which we use for the majority of cows. We keep our own replacement heifers (AI bred to Angus bulls) and retain calves and yearling to finish in a commercial feed yard. We have been on this program since the early nineties.

The reason we changed from the two-way rotational back cross was the time it took to correctly sort our cows to insure they were in the right rotation. Asking the experts at Clay Center the question, "simplify our life but keep our heterosis" the reply was use half blood bulls--a fairly startling answer at the time. We approached this slowly with one bull in a single pasture. According to the data we did give up a little heterosis but it did simplify our life and did not seem to alter our crossbreeding program.

How it all started. In the mid-eighties we started to use AI to breed our heifer calves. The objective was to utilized superior genetics. We depend heavily on EPD's for selecting the sires with calving ease and moderate milk and yet about average growth traits. The females from these first calf heifers made excellent candidates for replacement females. Additional information concerning bulls was solicited from university extension and

reproduction specialist and AI stud representatives and other ranchers. Information management was a key part of the whole and these sources are as important to us today as they were nearly 30 years ago when we started AI. In the mid-nineties, we started keeping a few of the bull calves from these mating to use as clean-up bulls for the heifers. The evaluation of the home raised bulls met our criteria for calving ease, growth, moderate milk and phenotype. A key piece advice from Tom Marcy, Marcy Cattle Company, Hay Springs, Nebraska (our Angus source) was: Would you buy the bull from me??? This has proved to be an excellent mental process as we evaluate bull calves. Over the years we have been very fortunate to keep the calving ease, maternal characteristics and growth in these replacement heifer bulls.

Even though we wanted to AI cows, the protocols in place at that time were not feasible under our management system. Luckily, we were asked to be part of a project conducted by Colorado State University (Ryon Walker, currently Beef Cow/Calf Extension Educator, University of Minnesota Extension) using a CIDIR protocol with replacement heifers and wet heifers (first calf heifers, calves at side). This was in 2003. The next year we bred the 3-year olds (that were bred the previous year) as well as that year's wet heifers. The AI program for our cows evolved from this project using a CO-Synch + CIDR with fixes time AI – 66 hours. Thus over the years we have the wet heifers and the cows that calf AI which are 60 days postpartum when we start to breed in the spring. Table 1 shows the age distribution of this group of cows from 2002 to 2009. The post partum interval is the selection criteria for the cows in the AI group. Of course all cows, AI or natural bred, are culled for bad udders, bad feet or other undesirable traits.

Table 1. The number of cows by year of birth (YB) remaining in the AI Cows Group

Cow YB	Breeding Year							
2000	2002	2003	2004	2005	2006	2007	2008	2009
2001	145	73	50	31	23	16	9	5
2002		138	61	35	17	14	4	2
2003			130	62	31	25	9	8
2004				155	85	56	21	19
2005					123	61	38	20
2006						140	52	37
2007							119	69

Matt Spangler, Assistant Professor/Beef Genetics Extension, University of Nebraska, Lincoln, Nebraska feels that the natural selection on the cow side and artificial selection with EPDs on the AI side may allow us to improve our reproductive efficiency under our environmental conditions and still select for the traits needed for feedlot efficiency. We have felt for a long time our primary product is the production of replacement heifers and now bulls and that the feeder cattle are the by product albeit they do "pay the bills" (Sometimes).

The cows that do not breed AI are bred by percentage bulls. The pregnancy rate on the AI cows for 2009: First Calf Heifers (Group 1) - 98% bred; AI Cows (Group 2) 98% bred. Of course, this represents both AI and natural conception Table 2. The conception rate for the natural bred cows was 95%. This was an excellent grass year and the conception are expect to be good but we have an excellent history of good conception rates especially on our younger cows.

Table 2. Breeding Schedule Quinn Cow Company

May 15	Start Breeding Heifers MGA Program

May 23	Mass Breed Cows
	CO-Synch + CIDR Fixed Time 66 hrs
	    Group 1- First Calf Hfrs with Calf
	    Group 2- Cows

June 1	Turn Out Bulls AI Groups 1 & 2
June 1	Turn Out Bulls Natural Bred Cows
July 1	Take Out Heifer Clean Up Bulls
Aug 1	Take Out Bulls Natural Bred & AI Clean Up
Aug 10	Ultra Sound Heifers for Pregnancy
Aug 10	Open Heifers to Feedyard

All cows have two tags for identification and we also record their bangs tags as an additional identifier. We keep records on all cows that track their dam, sires, maternal grand dam and maternal grandsire. Dr. Ivan Rush, Retired Beef Specialist Emeriti, University of Nebraska, Panhandle Research and Extension Center, Scottsbluff, Nebraska and others had advised us that one of the most important pieces of information in our program is the sire of the cow. This information is used as we make our AI mating. It has also allowed us to source and age verify the cattle that go to the feedyard.

We run the first calf heifers as a unit and the AI cows as a unit. All AI calves are tagged with blue tags, birthdates, sires and any pertinent comments recorded at birth. Ideally the cows that did not conceive AI are sorted off during or before calving so that the AI calved group are ready for the synchrony program with a minimum of sorting. The replacement heifers are also grouped in their own breeding and calving unit (Table 2). All the AI groups are kept close to the headquarters. The heifers are bred for five days and the cows are scheduled after this. We have two working facilities on the ranch and use one for each group so that we can stagger the CIDIR's and injections and then have the two groups mass bred on the same day close to the 66 hrs plus or minus. We started slow in our use of our raised bulls. Our first few we used with small groups of cows in single bull pastures and slowly expanded the program over several years. Our criteria for selecting AI sires were the same as when we bought bulls from registered breeders. Balanced EPD's with moderate milk and an eye on the carcass traits. As we have implemented this program over the past several years we continuously tract measures of reproductively efficiency and have noted no differences in our switch to our home raised bulls.

None of the AI bull calves are castrated at branding. This allows us to have an older calf and more time to evaluate the calf as well as his mother before we select the bull calves. Dr. Ivan Rush is an important part of "bull program" as is Loren Berger, Berger's Herdmaster Bulls, North Platte, Nebraska, who supplied our Simmental and Simmental cross bulls for many years before we started keeping our own percentage bulls. Tom Marcy was also an early source of input. All three men evaluated the cowherd and made suggestions to enhance the genetic selection and direction.

About 20% of the bull calves are sorted from the group, with a phenotypic emphasis for muscle with moderate frame. The bull calves are then put back with their mothers and another close evaluation is made for the pair -- phenotypically and genotypically. The bulls are closely evaluated for disposition during their development phase. The ration for the bulls is a simple growing ration of 10-12 pounds of dried distillers soluble, grazing, and alfalfa-grass hay. Periodically the bulls are weighted and weight per day of age is calculated.

Another sort on the bulls is made in the early spring and the final sort is made after the breeding soundness exam. Over the years very few bulls have failed this examination.

We have retained ownership on our calves since the early nineties. Collecting carcass data has been an important part of this process. It is a good source of information to validate our breeding program as are the pen close outs. The challenge for us has been the compilation and analysis of a rather unwieldy (*defined: difficult to manage because of the bulk*) set of data. We are still working with this mass of data and are using it as we can to track change over time Table 3. We hope to share more comparison data by December.

Table 3. 2004 & 2008 AI Sired Carcass Performance

Number of Head	Year of Birth	Year of Harvest	Hot Carcass Weight	Rib Eye Area	Quality Grade % Choice
84	2004	2005	759	12.1	76
90	2008	2009	817	12.9	90

We are trying to select those AI bulls with EPDs to produce moderate sized female calves with optimal milk and trying to find bulls within that group that do not sacrifice carcass merit. We have been fortunate to work with an outstanding commercial feedyard that feeds the AI sired calves and the QCC calves as separate pens Table 4. Due to structure of our AI breeding program approximately 90% of the AI sired calves are from two and three year old cows. Tom Williams, owner of Chappell Feed Lot, Chappell, Nebraska, has helped us evaluate the performance. He has made several trips to the ranch to look at both the cows and the bulls and his input is a continual motivation for improvement.   Feeding at this yard for the past ten years has been a good way to evaluate our program. It has allowed us to evaluate our genetic selection under a consistent program as well a monitor genetic animal health interaction through a close working relationship with the feedlot vet consultant, Dr. Phillip Kesterson, Trail Animal Clinic, Bridgeport, Nebraska . Dr. Kesterson works with our cowherd as well. We feel these types of long term relationships are key to maintaining the whole.

Table 4. 2009 AI Sired & Quinn Cow Company Sired Feedlot Performance

In Weight	Group	ADG	DM Conversion	Net sale wt lbs
677	AI Sired	3.39	6.45	1270
650	QCC Sired	3.42	6.26	1264

Developing our own bulls has been an interesting project. It has had its rewards and challenges. The continual question is -- can we produce bulls as good as we could buy.   We continue to finds way to both improve and validate this process with an input output balance. We continue to seek input and track performance. We continue to ask the question.

John Lawerence stated very well the challenges for genetic selection at the Beef Improvement Federation's 41st Annual Research Symposium, held April 30-May 3, 2009:

"Genetic progress in multiple traits is difficult when the goal is clearly defined. It is even more difficult if the goal is moving target due to changing consumer preferences of producer-cost structure. Commercial beef producers recognize that genetic decisions should be based on long-term profitability, but they live in a short-term world where profitability varies widely from year to year due to fluctuations in input and output prices."

At our ranch we are striving to do the best we can, with what we have, continually learning, building relationships, anticipating change and keeping the parts glued together with commitment and passion for the choices we make.