

## **Who said change would be easy!**

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### **Is the cattle industry really changing?**

Change is the cow business. Why? That is what the Dickinson Research Extension Center has set out to resolve. Why? The reasons include but not limited to three key points.

The first is vagaries of weather. Cattle require feed, and weather encourages or denies feed. Currently, denial has the upper hand. Producers simply cannot muster enough feed to logically expand the cow herd.

The second, consumers are people. Peoples' living habits have changed and once the taboo of utilizing food products for other living desires was accepted, cattle now compete directly for input resources. Thus, feed costs are accelerating, accelerating faster than expected product value. The cow herd will not expand without the opportunity for profit.

The third, producers have changed. In the labor intensive cow business, help is difficult to find. Cattle systems must not only be profitable but doable. We accept the weather; we acknowledge people; and we research new ways to help producers align the beef business with current and future culture.

The Center can respond, but in order to respond, the Center itself needed to change. In response to the issues of weather, the Center continues to expect cattle to survive in all weather. Cows are not pampered and human intervention facilitates herd health and individual care only when indicated.

Consumers are predictable, but the ramifications of a consumer choice may not be, since the data may not exist until after the choice. Perhaps that is the situation as multiple players bid for the corn or other input resources traditionally reserved for cattle.

In response, the Center has shifted to explore new cattle resources and inputs that may not directly compete with human desires. This response acknowledges industry change and seeks to create a new environment here at the Center designed to create a research, extension and teaching opportunity that addresses issues within the current industry. The change has not been easy or totally predictable.

### **Integrating a New Grass and Beef Production Model Isn't Easy**

The Center's response includes a shift in to grass production. In recent years, much discussion has been held regarding grass and beef production. The concept of integrating the two production activities seems like a no-brainer. If it was just the cows visiting with each other, that would be true. However, it is inevitable that people will get in the mix and that's when the no-brainer starts getting complicated.

The Dickinson Research Extension Center has slowly been moving the basic beef-

production model to a grass-production model. The process is complicated because three very large industries meet at the crossroads, which are the cow and grass business and the business of putting beef in front of the consumer.

As has been noted many times, one fundamental point is prevalent among all the charts, trends and rhetoric about the beef business: The beef business does not exist without the business of the cow because the cow is the foundation. Without cows, there is no beef or beef business.

Likewise, without grass or some similar forage plants, the cow business does not exist.

So we're back to doing what those in academia do, which is ask questions and seek answers. As the center has inched its way to establishing a different model of cow, grass and beef production, each meeting ends with more questions. What if this? What if that? Do we really know? From the onset, there are more questions than answers.

In the process, the center is trying to sort out some fundamental issues that besiege newness. For example, technology is good and improvements are even better. However, one of the first stumbling blocks of working cows within a grass model is that much of the technology was developed for a grain-based industry. This is not a negative. However, the delivery systems to implement the technology meant that the cows essentially were brought to the technology.

Therefore, developed were better cattle-handling facilities and better delivery and feeding systems to handle cattle within the more confined facilities. Also developed were more improved methods of handling waste products generated in the confined facilities. This process was started and certainly encouraged as crop producers became more efficient at crop production.

Because the ability to produce bountiful yields accelerated quicker than the human population could distribute and consume the increased crop production, the current animal industry (including cows) slowly morphed into a grain-consuming business.

In the big picture, almost all, if not all, producers were educated, started and perfected their careers, and now are getting ready to retire. Their education and careers were based on a system of food production that started in the middle of the last century.

What is wrong with that? If one might answer one's own question, nothing is wrong with that. Crop production continues to perfect itself in an effort to meet the human demand for food. The challenge is that not all plants are intended for direct human consumption. Not all land is suitable for crop production. Not all land is required to house or entertain people. So the question, debate or what we do next rests with the usage of the remaining lands.

Yes, cattle work well while grazing these lands. As the center proceeds, the first step is to identify those weak spots in the production system that could be improved through research. Much like the example of technology implementation, once the question is asked, baseline observations can be noted and future questions answered through good research.

## **Two Pounds of Average Daily Gain Equals Grass Beef**

The immediate goal is to establish cow-calf production on grass and then record what is or is not working. Growing grass is good and harvesting the grass through the cattle is great, but the end product must increase in value every day to make the process worthwhile.

Beef on grass sounds so simple: Open the gates and let the cattle graze. However, the questions outpace the answers. What is the optimal gain for cattle on grass? What is the optimal gain for steers on grass?

The nutritional needs of the cattle must be met by the grass that is in front of them. The grass will sustain the cattle. However, the grass must not only sustain the cattle, in particular the cow, but also add weight to the steers or market cattle.

So how does one set goals? Some thoughts at various meetings bring some interesting concepts to the table. For instance, if one wants to market 1,300-pound live-grass steers by 2 years of age, the steers will need to gain 1.7 pounds per day to meet the challenge. In fact, at 1.7 pounds per day, the steers easily should weigh more than 1,300 pounds.

Figure those 365 days per year for two years equals 730 days gain. At 1.7 pounds per day for 730 days - equals 1,241 pounds of gain. Add in the typical birth weight of 86 pounds and you get the 1,300-pound or more steer at 2 years of age.

Will the cattle gain that weight? It is well understood that cows and calves gain well on grass. The cows will lose some weight as they nurse their calves, but the calves will gain weight throughout the summer by nursing momma and eating grass.

Typically, for those producers enrolled in the North Dakota Beef Cattle Improvement Association's CHAPS program, young nursing calves gain approximately 2.5 pounds per day on pasture. However, once those calves are weaned, the questions have fewer answers.

The Dickinson Research Extension Center summered yearling steers last year. Those steers gained more than 2 pounds of body weight per day on summer grass. So, the limited work at the center would suggest that grass will support 2 pounds of average daily gain, even for yearling steers.

Although the center has not evaluated growth through all the grazing months, given the starting and ending weights, the average daily gain of 2-plus pounds from May through a good part of October seems very plausible. That would account for two six-month periods that the steers can gain 2 pounds a day, or 730 pounds total. Adding in the typical 86-pound birth weight, the center should be able to produce 816 pounds of saleable beef coming directly off grass.

Last fall, a sample set of steers came off grass at just more than 1,100 pounds in mid-October. So from weaning to grass turnout the following spring, these steers only gained slightly less than 300 pounds for the six winter/spring months. That is less than 1.7 pounds per day. If one wants to be more critical and assume that 2.25 pounds of gain can be obtained during two growing seasons, then 820-plus pounds should be gained. If you add in the 86 pounds of birth

weight, then 900 pounds of saleable beef should have been produced.

That only leaves 200 pounds of gain that need to be produced during the winter/spring months, or just more than a pound per day of average daily gain. That is not acceptable.

So everyone around the table gets kind of fidgety and even questions how in the world a grass system can work during the non-growing season. The growing season is good, but providing enough forage during the non-growing season is a real challenge. Extending the grazing season so that those winter/spring fall gains can be met in a pasture system is even more of a challenge, so some leave the room.

However, challenges are good and some goals have been framed. To start with, at least a minimum average daily gain of 2 pounds per day should be expected and certainly achieved during the normal growing season for calves and yearlings. In reality, 2.25 to 2.5 pounds per day during the entire forage-growing season may be a reachable goal.

It only seems right to expect calves following weaning to be able to maintain summer performance. In which case, the same goal could be set, which is 2 pounds of average daily gain through the non-growing months. If that can be achieved, then during the course of 18 months (initial six-month growing season, six months of winter/spring non-growing season and then a second six-month growing season), a producer could have a goal to market 1,200 pounds of saleable beef off grass and harvested forage.

Well, 1,200 pounds is not 1,300 pounds. Reaching 2 pounds per day of gain on forage during the non-growing season has not been achieved at the center. However, we are up to the challenge, keeping in mind that maximum gain, which is the maximum amount of beef produced on any given day by an individual steer, is no longer critical.

#### **Four, Three or Two pounds of Gain, So What?**

If a 400-pound calf can gain 4 pounds per day, the calf would reach 1,200 pounds in 200 days or 1,500 pounds in 275 days. That same calf could be asked to reach 1,200 pounds at 3 pounds per day gain in 267 days or 1,500 pounds in 367 days.

Whether the calf gains 3 or 4 pounds or somewhere in between, as long as the producer provides enough energy within a balanced ration and the calf has the genes to achieve the desired growth, the calf will hang on the rail and more than likely meets the demands of a consuming public.

That is all considered good, but the key is and always has been the need to supply grain-based rations to allow those rapid-gaining genes to express their capacity to produce beef. If we decide that same calf needs to gain 2 pounds per day, then 400 additional days are needed to reach 1,200 pounds or 550 days are needed to reach 1,500.

Perhaps, in this scenario, 1,500 pounds is too heavy, but 1,200 pounds is not and there still would be an expectation that some of these steers will reach heavier weights.

It may seem mind-boggling, but many commercial cows today can be managed and bred to meet any of the previously mentioned production systems. Keep in mind that we are talking about starting with a 400-pound calf and not putting any demands in this discussion as to how the calf got to 400 pounds.

We would anticipate that the 400-pound calf that gains 4 pounds per day to reach a marketable weight is probably at a different age than the 400-pound calf that gains 2 pounds per day to reach a marketable weight. That may or may not be true. For now, let's continue our discussion of only the weight gain between 400 pounds and the market.

If end product value is set at \$1.20 per pound of live weight, then a steer that gains 4 pounds per day generates \$4.80 per day gross value and a steer that gains 3 pounds per day generates \$3.60 per day gross value. The steer that is gaining 2 pounds per day generates \$2.40 per day gross value.

If the end point is 1,200 pounds, then all the steers, regardless of weight gain, generate \$960 in additional gross value to contribute to the owners' costs. All the calves probably are acceptable for producing beef for the consumer.

The amount of energy that needs to be fed into the system certainly decreases as gain goes down. However, the proportion of that energy that is required just to maintain a steer on any given day goes up. Perhaps it is only those at the center or only me, but that does become a very serious point of pondering.

At what point does the beef industry pass the baton from the grain producer to the grass producer? The answer is not hidden in long philosophical discussions but in quick math. When the price of daily grain intake tips the scales and consumes too much of the potential \$4.80 per day increase in gross value, other alternatives will be sought.

At least for me, it is nice to know that the projections for beef systems that do not rely on grain are doable. The end product would be acceptable, but the reverse question needs to be pondered and calculated. If these lower-gaining cattle are generating only a \$2.40 per day increase in value, then at what point does the cost of forage make grass beef impractical?

As the production of grass beef continues at the center, the search needs to be widened as various forages are evaluated for the ability to put gain on steers. Simultaneously, proper cattle genetics needs to be screened more aggressively for the ability to add gain on total forage systems. Neither appears to have been done extensively in the world of research.

### **Late Calving Changes Management**

Shifting gears, the standard processes that have been developed and followed for years, such as vaccinations and calf-working schedules, need to be modified as well as the Center changes.

One can see why change is difficult. At the Dickinson Research Extension Center, the cows are finishing the calving season. However, this year, calving was in early June, not late

April. Like most producers, keeping track of the cows and calves is important, but the pens are now pastures and the calves are fast.

As the center is changing, the ripple effect is interesting. A lot of things that we used to do just don't fit anymore. Perhaps better put, some things seem untimely. The standard processes that have been developed and followed for years, such as vaccinations and calf-working schedules, need to be modified.

For example, some obvious changes were the well-rounded, belly-deep cows that were turned out to cool-season pastures with no calves at their side. There were no cow weights to be taken because the center avoids weighing cows during late pregnancy.

The center staff could live with that. However, as the cool-season grazing shifted to warm-season grazing in June, the cows were mixed because some still were pregnant and there was a whole range of calves from a day old up to 5 weeks of age.

The calves were due on May 19, but babies do not always read the book, so calving actually started the first week of May. The actual calving distribution, starting on May 1, shows four calves the first week, 14 the second, 54 the third, 56 the fourth, 53 the fifth and finally calving started winding down by June 5.

The cows are done calving which means a lot. Why? Well, let's back up. Bull turnout dates set most, if not all, managerial dates for a cattle producer. The center's bull turnout date in 2010 was June 1. For 2011, the center's bull turnout date was Aug. 8. Therefore, the appropriate vaccinations and calf working dates all changed.

Traditionally, with an early May cool-season pasture turnout, early June warm-season pasture turnout and a June 1 bull turnout, calves started arriving in late February. Calving essentially was done by late April, with most, if not all, calves vaccinated and worked by the early May cool- season pasture turnout.

The calves were good to go for the summer, with pre-weaning vaccinations the next work day. The late-calving scenario is more complicated and somewhat problematic. Keep in mind, as the Center does, bringing cows home is not easy. Rounding up cattle in pastures is not easy. Gathering calves for whatever reason is never easy. That is why historic calf-working days were always placed on the calendar years in advance so that appropriate family and friends could help gather.

Likewise, fall roundups historically are scheduled as well and messing with those schedules has profound impacts. In fact, I once heard of a producer who decided to change the roundup date to a week earlier only to find out that, as the cattle advanced to the traditional load site, the producer's own site already was occupied by the neighbor. That was poor communications, but the point certainly needs to be noted that changing a cow-calf enterprise has huge consequences.

The Center struggled because a few pregnant cows needed to be moved from the cool-season calving pastures to native pastures. None of the calves are ready to work, so there are no

spring work days. The next time the cows will be available for anything will be mid-July or mid-August, depending on pasture location. At that time, the calves will be branded and vaccinated.

Because the fly season will be upon us, castration and any dehorning will need to be postponed until fall. Those changes seem workable, but the number of pregnant cows that were turned out to native pastures was not.

As with many management plans, tweaking is good. This year, bull turnout will be moved to Aug. 1, so the calves will be due on May 12. That will be a week earlier and should ensure that more cows will be available for sorting to native pasture allotments.

Keep in mind, as well, that moving the cows to cool-season pastures on May 1 can be difficult if too many cows are calving. If the same calving distribution is used based on this year's calving book, the center will have a few calves while the cool-season pasture turnout is taking place. However, the vast majority of the cows should calve in May, which leaves the tail end to calve in early June.

Again, bull turnout sets everything, and the impacted windows tend to be unforgiving. Well, pasture turnout looks resolved. However, what about weaning? That's another huge discussion. Currently, the Center is planning a mid-November weaning.

### **Does late calving mean late weaning?**

The Dickinson Research Extension Center changed calving dates, so the bull turnout date this year will be Aug. 1. A slight adjustment backward by one week was made to better position the birth of the calves between May 1 and May 31. However, that brought up the question: Does late calving mean late weaning? If one listens carefully, many presenters will hedge. "That depends" is the most common answer.

In reality, cow-calf operations require a certain level of gross income to survive. Very often, the bottom line is discussed, but, for most operations, gross dollars drive the business. If enough money is put into the operation, the expenses seem to get paid and the family seems happy.

That probably is very poor economics. Most would agree that better money tracking always is warranted, but it does take gross income to have net income.

The challenge in late calving is pretty obvious. Calving two months later means 60 days of missed growth if one assumes a producer weans and sells on traditional dates. Those 60 days at a typical average daily gain of 2.5 pounds would be equivalent to 150 pounds.

Although market reports can be found in many publications, for discussion purposes, let's say that those calves could sell for \$1.50 to \$1.75 per pound in mid-November. The gross dollars will be shorted by \$225 to \$262 if assuming that these are typical calves that are bawling at a typical auction barn. These later-born calves certainly are going to be bawling loud and certainly will have a greater incidence of health issues if sold right off the cow.

Management change No. 2 following the changing of the bull turnout date becomes pretty obvious. To maintain some semblance of normalcy while sitting in the auction ring, it would appear that later-born calves may need to be weaned later and certainly need to be kept at home to be grown. Home and grown could mean that the calf is on the cow or off the cow. It is the producer's choice.

The best answer at this point again appears to be "that depends." Before another major managerial change is made, please note that it is perhaps an unfair assumption that the typical beef producer cannot lower production costs greater than the \$225- to \$262-per-cow hit the producer takes in calf value.

Regardless of the total cost reduction within the herd, that is a lot of money on a per-cow basis. With costs going up, it maybe still is a worthy challenge. Ultimately, it will be up to the individual producer.

At the Dickinson Research Extension Center, a less challenging approach seems more palatable. The center will delay weaning the calves and also keep the calves on winter forage. The delayed calving also means how the calves are worked needs to be modified. As calves are moved to summer pasture, calf branding and vaccination for clostridial diseases will be delayed. The delay is triggered by the desire to work the cows and calves efficiently while making sure all the calves are present.

It would appear at this writing that the cow-calf pairs will be gathered during pasture rotations from mid-July to mid-August, which allows us access to the calves. The next logical calf work days will be in mid-November, when the cow-calf pairs are moved off pasture. This still could be problematic because an early winter may freeze water supplies, so we need some flexibility and caution.

What one does not want to do is trigger the ranch and crew into a crisis mode due to weather issues in the fall. Traditional pre-weaning gatherings are not being scheduled. Instead, the calves will be worked as cattle are removed from scheduled summer pastures.

Once the calves are vaccinated and settled in, the big challenge will be to develop managerial plans that will keep these calves gaining weight at 2 pounds per day through their stay at the ranch.

The question returns as to what to feed the calves. If the goal simply is to maintain summer gains of 2.5 pounds per day, then many grain-based rations easily will put 2 to 3 pounds per day on the calves so that by mid-January, they will be ready to go market as fine back-grounded calves.

For many producers that have moved their calving date to May, the obvious adjustment at the other end is to wean at 5 to 6 months of age and background the calf long enough to make up the difference in lost gross dollars because of lighter calf weights. However, feeding equipment and facilities will need to be addressed. For many cow-calf producers, this will be a challenge.



## **However, gone are the good old days**

Some food for thought: \$3 corn costs a nickel on an as-is basis and so does \$100-per-ton grass hay. However, the cost per pound of TDN is quite a bit greater in the grass hay (10 cents) than in the corn (7 cents). The reason is simple: Corn has more TDN per pound than grass hay, so when the price is the same on a raw purchased basis, corn is the better buy. Therefore, the long-term trend is to integrate corn into the beef business and lower the amount of hay fed. This becomes even more pronounced as soon as one starts paying the trucking bill because the bulkiness of hay will not allow full-weight loads per haul.

However, if corn were to reach \$9 per bushel and local hay could be purchased at \$150 per ton, the cost per pound of TDN would be greater for corn (19 cents) than grass hay (15 cents). In fact, quite a bit greater for corn than grass hay.

Energy availability, whether expressed as total digestible nutrients or megacalories, is the life blood of a cattle operation. What's the reason? When feedstuffs are not available, there is no energy to support life. One assumes some forage always is available, but in extremely dry years, forage may need to be brought in.

In previous years, when grain was more reasonably priced, purchasing a combination of grain and some hay made fiscal sense. In other words, the ranching operation could hold its own until the rains came. Currently, that may not be the case.

It is critical to do some price shopping and evaluate what nutrients one needs to purchase. In this case, even at \$150 per ton, hay is cheaper per unit of TDN than corn. In all my years of running cattle, I never have had to consider purchasing \$150 hay.

The common response always was, "That must be dairy hay." On the flip side, the dairy business always has been considered a high-performance business, so we have the increased price of inputs. The beef cattle enterprise also may need to continue to elevate performance to justify the increased price of inputs.

## **Finally**

Cattle always are on the cutting edge, at least commercial cattle are. That means the average cow can be called upon to fit many niches.

This is not true of cattle that are focused on their genetics to produce specific products. Again, for the most part, commercial cattle fit and meet the broad expectations of their owners. Given that, adding more muscling, increasing quality grade or simply hanging smaller or larger carcasses can be accomplished by tweaking management and shifting genetic inputs.

Cattle respond to change quite well, and producers rely on those short-term changes to keep up with the markets. In terms of meeting the increased pressure to lessen grain inputs and increase forage-based inputs, the same concept is true.

In closing, the Center has shifted to explore new cattle resources and inputs that may not

directly compete with human desires. This response acknowledges industry change and seeks to create a new environment here at the Center designed to create a research, extension and teaching opportunity that addresses issues within the current industry.

As the Dickinson Research Extension Center shifts from a grain-based beef production model to a grass-based beef production model, future projects will be designed and implemented that will provide data to evaluate industry questions. The future is certainly not easy to predict, but moving forward based on sound research is critical.

Although not addressed within this article, the issues of appropriate cow size and bull genetics will be addressed as the Center evaluates grass systems of production. The additional concerns of cattle temperament on grass, handling systems and effects on carcass merit will also be discussed and evaluated where possible. Ultimately, final beef products will be harvested, processed, prepared and evaluated by consumers.

Although some of the questions may be evaluated reasonably soon, the production data will need to be combined with fiscal data to fully evaluate any economic and financial opportunities the grass-based beef production model may offer over the current grain-based beef production systems. Efforts to not only understand new beef production systems but also to create added demand and value for beef products are critical.