Update from the Feedyard

By: Chip Kemp

The Steer Profitability Competition calves have adjusted very well to the feedyard, thus far.

Kenneth Ladyman, manager of the University of Missouri’s facility, has spoken very highly of the quality, docility, and appetite of the group of calves. Ladyman has shared several tidbits of information that have me excited to get our first monthly GrowSafe report in a couple weeks.

As I am currently writing this update, not a single calf has had a reason to be treated for any illness or health concern. Not a single one.

That is extremely impressive for a commingled group of steers.

Also, at this time the average calf is steadily consuming 30.5 lbs of feed per day on an “as fed” basis and 22.9 lbs of feed per day on a “dry matter” basis.

This is both exciting, and impressive for a group of steers that come from different parts of the nation.

Your hard work in producing and preparing your calves is obviously paying off.

We are off to a great start and I am excited to see the progression of the calves through out the next few months. Well done young cattlemen and cattlewomen!
The Random Shuffle of Genes: Putting the E in EPD

Editor’s Note: This article was originally written by Jared Decker with the University of Missouri Extension.

Even though expected progeny differences (EPDs) have been used by the beef industry for over 40 years, many misconceptions still exist. Occasionally we will hear a producer say something like, “I bred my cows to a low birth weight bull, but I had a couple of large calves.”

What the producer does not realize is that this is to be expected based on the inheritance of complex or continuous traits. Let’s look at this more closely. A calf inherits about 50% of its DNA from its sire, with the other 50% coming from its dam. Each sperm that is produced by a sire is a random sample of that sire’s chromosomes and genes. Cattle have 30 pairs of chromosomes.

So, when a sperm is produced, it is similar to flipping 30 coins. If we label the chromosomes the sire inherited from his father as blue/paternal and the chromosomes inherited from his mother as pink/maternal, there are 1,073,741,824 possible combinations of the sire’s paternal and maternal chromosomes. This number ignores the swapping of parts between paternal and maternal chromosomes in a biological process called recombination.

The number of possible chromosome combinations is in the billions! We often state this as progeny receive a random sample of the sire’s genes, and with billions of possible combinations no two sperm are exactly alike.

Think for a moment about your favorite set of full siblings. Perhaps this is the celebrity family with a reality television show, your brothers and sisters, your children, or your favorite set of embryo flush mate calves. The dissimilarity between these siblings may be striking, for example, one may be short and the other tall, one may have light hair and the other dark hair, or one may be laid-back and the other excitable.

The similarities between siblings are due to shared environment and shared genes. The dissimilarities between siblings are due to differences in environment and genes which are not shared. Siblings share 50% of their DNA on average, but in humans this can vary from about 40% to 60%. Because their genomes are similar in size, we can expect a similar distribution of shared genes in cattle.

The sharing of genes between siblings is due to the random segregation and shuffling of genes during the formation of sperm and eggs. If we assume random mating and that the parents are unrelated, we can show mathematically that the breeding value variation observed between a set of full siblings will be half of the breeding value variation observed in the population.

Even if our assumptions about random mating and unrelated parents do not hold up in real populations of cattle, the variation between full siblings will still be quite substantial.

Unfortunately, in the past embryo transfer flush mates have been marketed by some seedstock producers as containing identical genetics. The only cattle that share identical genetics are identical twins and clones.

Because birth weight and weaning weight data from embryo transfer calves are not typically used in national cattle evaluation, the flush mates have identical EPD profiles early in life. These EPD predictions remain identical until data on the flush mates’ progeny is recorded. These identical EPD profiles are simply the parent average EPDs.

Like all parent average EPDs, these EPDs are not precise because the EPD estimation equations do not have data to predict the gene variants inherited from the sire and dam.

Genetic tests that provide genotypes on thousands of DNA variants enable an estimation of which set of genes an animal actually inherited. This information is then combined with the traditional pedigree EPDs to produce more reliable genomic-enhanced EPDs.

In a slightly different approach used by the dairy breeds and by the Santa Gertrudis beef breed, the pedigree relationship information used to calculate EPDs is supplemented with genomic relationship information. Shared DNA variants are used to estimate how closely related two animals are; in other words their genomic relationship.

This procedure can tell whether a calf is more closely related to its paternal grandsire or its paternal granddam, thus tracking the inheritance of the sire’s chromosomes and identifying the Mendelian sampling term.

Based on averages, we would expect a calf to share 25% of its genes with any of its grandparents. But, due to the random shuffle of genes and chromosomes, this percent can vary greatly.

It is important to remember that EPD stands for expected progeny difference. Expected refers to a statistical expectation, which means a prediction or average. Thus an EPD is the predicted average difference between a sire’s calves and the EPD base. EPDs predict averages. An individual calf can have a very different genetic merit from the sire due to the random sample of genes it inherited.

In conclusion, a calf shares 50% of its DNA with its sire and 50% of its DNA with its dam. On average, two full siblings also share 50% of their DNA. But, which DNA variants are shared between a parent and a calf or two full sibling calves at birth is unknown.

It is only when more data is collected that we are able to estimate this random sample of genes. Genomic enhanced EPDs use DNA information to estimate the random sample of genes inherited from the parents and result in more accurate and reliable EPDs for young animals. The random shuffle of genes and chromosomes puts the expected in EPDs.
Prevention is the best cure for feedlot losses, producers attending a recent backgrounding and feedlot school were told.

“Not only are we trying to keep calves alive, we are trying to keep them from getting sick altogether,” said Wayne Tomlinson, an extension veterinarian with Manitoba Agriculture, Food and Rural Development.

“We can’t do much about the agent, it is going to be around, it is going to be in your feedlot. It is the nature of the beast. What we can control to some extent is the host and the environment.”

Tomlinson, who also has 22 years in private practice, presented to a group of beef producers at the Manitoba Beef Background and Feedlot School presented by MAFRD in Brandon.

“Seventy-five percent of illness in calves in the feedlot is due to pneumonia, which we call bovine respiratory disease or BRD,” he said.

Looking at the dynamics of the feedlot, Tomlinson stresses the importance of having the appropriate amount of well-trained staff who are able to handle calves quietly and efficiently to maintain a low-stress environment.

“We know that stress is a huge factor contributing to animals getting sick. The low-stress handling in cattle does make a difference to their immune systems and how they survive.”

Receiving pens should be clean, dry and offer a decent amount of space that is wider rather than deep.

“A wider pen means more bunk space and the calves can’t hide in the back of the pen. Other pens in your feedlot can be different, but your receiving pen should be shallow,” said Tomlinson.

“When calves first arrive we want low stress, we want to get these guys eating and make sure they have had their vaccination prior to arrival. All of these things are going to make a difference in their ability to stay healthy.”

When looking to bring calves into the feedlot, producers should try to purchase the animals from a known source that offers preconditioning.

“Preconditioning works. If you bring in preconditioned calves that have been vaccinated prior to coming into the feedlot, they’re bunk broke and they have had all the processing procedures done, we will see a lower death loss.”

It is also beneficial to know the health history of the cow and, if possible, the history of the herd.

Tomlinson also notes that older and larger calves, 700 pounds or more, tend to do better.

A key factor in raising a calf to be strong and healthy in the feedlot is to ensure adequate colostrum early in its life.

“We all know that colostrum is really important for a calf in the first six weeks of its life. We know that they are born with a naive immune system and they have no antibodies and if they don’t get that first milk, they are going to get sick,” said Tomlinson.

“Preconditioning works. If you bring in preconditioned calves that have been vaccinated prior to coming into the feedlot, they’re bunk broke and they have had all the processing procedures done, we will see a lower death loss.”

If you can’t do the low-stress weaning techniques, at least put that cow-calf pair in the pen together for a while so that the calves can find everything and get comfortable. That will make everything easier for them.

Calves that receive pre-weaning vaccinations have also shown reduced mortality rates. Tomlinson said monitoring the calves is also critical, especially when they first arrive in the feedlot. Pre-illness symptoms to watch for: depression, anorexia, dull eyes and temperatures over 104°.

“When in doubt, pull the calf out. Just because you pulled a calf, if you pull him with low-stress methods, walk him up into the chute and have a look at him. If he’s not sick you can always send him back, but you should pull anything you’re not sure of,” said Tomlinson.
SpC Speaker Spotlight

Dr. Brandi Karisch

Dr. Brandi Karisch currently serves at the Beef Cattle Extension Specialist at Mississippi State University.

Her role at MSU includes both teaching and research to provide tools and management solutions for beef producers to improve production, profitability, and sustainability.

Her research program has recently focused on management and nutritional factors to improve the health and performance of high risk stocker cattle.

She is a native of south Louisiana, and received her bachelor's degree from Louisiana State University in Animal Science, where she was an active member of the livestock judging team.

Her graduate degrees both come from Texas A&M University with a focus on beef cattle nutrition.

Dr. Karisch's roots run deep in the Simmental breed. She received her junior membership and first registered cow when she was just 2 years old.

As a junior, Dr. Karisch was an active participant in the American Junior Simmental Association's programs.

She credits much of her success and friendships gained along the way to her time spent traveling the country to Regional and National Classics.

She and her husband currently own MBK Cattle in Starkville, MS, and focus on producing functional cattle designed to perform well in several aspects of the beef industry.

Sponsorship Highlight

Chappell Feedlot, Chappell, Nebraska

Since October of 1992 Chappell Feedlot has been striving to meet the needs of progressive ranchers to maximize the genetic potential and increase the value of their calf crops through retained ownership cattle feeding.

In October of 2017, Chappell Feedlot celebrated its 25th year of being in the cattle feeding business.

The business model of CFL over the span of its 25 years has been geared to utilize carcass ultrasound sorting to maximize grid marketing price discovery and capture premiums and minimize discounts aside from the cash cattle market.

Since the company’s inception, CFL has believed that providing its service based on proven technology combined with good old fashioned common sense can consistently generate their customers additional revenue.

Individual harvest collection data is returned to each cattle owner to utilize within their program, in addition CFL has incorporated 4 pens with the Grow Safe system to accommodate customers looking for feed efficacy data.

Tom and Cindy Williams, Founders of CFL have worked extensively to build backgrounding programs with many local sources to offer customers the ability to develop their calves outside the feed yard and feed as a yearling to suit their client’s individual needs.

These programs have been relied on heavily over the years by our customers allowing early calf weaning implemented into their operational needs.

Located in western Nebraska, just off interstate 80, leaves Chappell Feedlot easy access to all the major packers and a very diverse region of farming.