



RIPPE GELBVIEWH



TAKING PRIDE IN OUR CUSTOMER'S SUCCESS

A Publication of Rippe Gelbvieh

January 2012

Paternal Heterosis & Hybrid Bulls (Balancers) by Jack C Whittier

Much has been written and is well understood about the value of heterosis (hybrid vigor) in several facets of production agriculture. Hybrid corn is a mainstay in the corn industry and has provided tremendous improvements in corn yields over the past century. According to USDA: "About 95 percent of our corn acreage now is planted to hybrid corn. We [the U.S.] produce at least 20 percent more corn on 25 percent fewer acres than in 1930, when seed of hybrid corn became available in quantity to American farmers."

In the beef industry, use of heterosis to improve production has shown similar advantages. Numerous research studies have reported up to a 25% improvement in pounds of calf weaned per cow exposed when crossbred dams produce crossbred calves. There are three main types of heterosis, they are:

Individual heterosis – the improvement in performance by the individual crossbred animal above average of its parents. Increased weaning weight, yearling weight and carcass traits are examples of individual heterosis in crossbred compared to straightbred calves.

Maternal heterosis – the combined improvement in traits from the dam that cause increases in the performance of her and of her progeny. Examples of maternal (female) heterosis in a beef cow include: younger age at puberty, increased calving rate, increased survival of her calf to weaning, longevity, and pounds of calf produced in her lifetime.

Paternal heterosis – the improvement in productive and reproductive characteristics of the bull. Examples of paternal (male) heterosis include: reduced age at puberty, improvements in scrotal circumference, improved sperm concentration, increased pregnancy rate and weaning rate when mated to cows.

Individual and maternal heterosis are frequently discussed and written about. However, the benefits of paternal heterosis have often been ignored. This may be due to fewer examples of paternal heterosis in the scientific literature and until recent years somewhat of an aversion to crossbred or hybrid sires. The purpose of this article is to explore paternal heterosis in hybrid bulls and to discuss trends in use of hybrid sires by the beef industry.

Paternal Heterosis of Bull Reproductive Traits

In 1987 researchers in Kentucky published a summary of research using crossbred sires in the Journal of Animal Science. This article lists some of the advantages from paternal heterosis. The authors reviewed and synthesized nine published reports that dealt with the productivity of crossbred bulls for commercial beef production. The Kentucky review focused primarily on reproductive traits of yearling

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Hello everyone, the bull pen has been sorted and is ready for your viewing. I hope you find some valuable insight in this newsletter. If you have any questions about the newsletter, or have some special request for other information, feel free to give me a call anytime at (316) 323-4874.

Sincerely,

Dustin Rippe

Bull Sale:

March 10, 2012

@ Belleville 81 Livestock

The bulls have been handpicked and are ready for viewing. Boys, this is a great group of bulls. We will ultimately market about 56 bulls this year with a good mix of balancers and purebreds. Come take a look whenever you want. We would be happy to show what we have this year and discuss our breeding program. Videos of each bull will be posted on our website prior to our sale.

crossbred and straightbred bulls and included results from both Bos taurus x Bos Taurus matings and Bos Taurus x Bos Indicus crosses. The conclusions of this review are summarized in Table 1.

Table 1. Results of various reproductive traits of crossbred bulls compared to straightbred bulls of the same parental breeds.

(From: Thrift and Aaron. 1987. J. Anim. Sci. 65:128.)

These data illustrate a significant improvement in semen characteristics of crossbred bulls, whether Bos Taurus or Bos Indicus crosses. However, pregnancy rates produced by crossbred sires were only slightly improved. This may be due to the fact that according to most reproductive physiologists, fertilization occurs upwards of 99% of the time when a viable ovum and sperm cell meet in the oviduct. There is however a high loss of fertilized embryos between fertilization and maternal recognition of pregnancy. This loss appears to be primarily controlled by maternal rather than paternal factors.

The reduction in average date of calves born when sired by crossbred bulls is interesting and may be the most important response shown in this research. Calves born earlier have more growing days to a set weaning date which translates into heavier calves at weaning. When cows have upwards of 8 to 10 days longer to return to estrus following calving before the next breeding season this will also be an advantage in cow herd management.

The greater concentration of sperm cells and the improved initial motility should enhance collection, extension and freezing of semen from crossbred sires for artificial insemination. These traits would also improve the ability of young crossbred sires to successfully pass a breeding soundness examination prior to being offered for use as yearling bulls. It is my observation that both of these results are being seen in the beef industry as more hybrid and composite bulls are being used.

Keith Gregory, the principal researcher in the USMARC Germ Plasm Utilization project, characterized heterosis as the release of genes from dominance that accumulates in animals over many generations by narrowing the genetic diversity in geographically isolated populations. Therefore when the accumulated inbreeding suppression is released by mating to animals with varied genetics, the release of dominance allows improvements in animal performance. In this case, the improvement in male reproductive traits of crossbred compared to straightbred bulls as shown in Table 1.

A very positive advantage of maternal heterosis in crossbred cows is the increase in longevity. For example, 22.7% percent of crossbred cows survived in the herd to 12 years of age in a crossbreeding study in Nebraska while only 14.2% of straightbred cows survived to that age. This was likely due to higher fertility and a more robust composition of crossbred cows. Longevity in bulls in our modern beef production systems does not typically play a major role. This is because bulls characteristically are not retained into advanced years in order to avoid sire-daughter matings and to introduce improved genetics into the herd by from younger bulls.

Developments in Hybrid Bull Usage

Beef production systems continue to evolve in the North America. Perhaps as a result of early research showing the advantages of crossbreeding in the 1950's and 60's, there was a major period of importation of different breeds into North America in the late 1960's and early 1970's. Many, but not all, of these breeds originated in the European Continent and the term "Continental Cattle" was coined to distinguish these breeds from "British Breeds" originating from the British Isles and prevalent in North America at that time.

Combinations of Bos Taurus with Bos Indicus breeds like Brahman have been made. Santa Gertrudis were developed by the King Ranch in Texas by combining Shorthorn and Brahman. In the 1960's and '70's the American Simmental Association began recording Simbrah and the American-International Charolais Association recognizes Charbray as a 5/8 Charolais x 3/8 Brahman breed.

Reproductive Trait	Advantage of Crossbred Bulls Compared to Straightbred Parental Breeds	
	Bos Taurus x Bos Taurus	Bos Taurus x Bos Indicus
Appearance of first motile sperm	7.0 %	-
First completed mating	6.1%	-
Age at puberty	1.8%	5.0%
Initial sperm motility	33.3%	10.0%
Sperm concentration	36.4%	56.0%
Scrotal circumference	4.4%	8.4%
Pregnancy rate when mated to cows	0.2%	1.4%
Weaning rate of calves sired	4.0%	3.7%
Average date of calves born	10 days earlier	7.8 days earlier

Following a trial and error phase of breed combining, probably driven by research coming from the GPE and GPU projects at USMARC, there began to be recognition that combinations of Continental and British breeds frequently matched production systems and market signals. Several value-based programs developed that encouraged this. Within the last decade three of the major 'continental' breed associations in the U.S. have developed hybrid programs within their breed registry.

Currently, the most common hybrids of British and Continental are SimAngus, Balancer and LimFlex. Each of these three hybrid programs recognize animals with varying percentages of Continental and Angus or Red Angus. In each case sire and dam must have registrations with an association. SimAngus are $\frac{1}{4}$ to $\frac{3}{4}$ Simmental (SM) and $\frac{1}{4}$ to $\frac{3}{4}$ Angus (AN) or Red Angus (AR) and the sum of SM and AN or AR blood must be at least $\frac{3}{4}$. Balancers contain $\frac{1}{4}$ to $\frac{3}{4}$ Gelbvieh (GV) and $\frac{1}{4}$ to $\frac{3}{4}$ AN or AR, with a maximum $\frac{1}{8}$ unknown or other breed genetics. Similarly, LimFlex contain $\frac{1}{4}$ to $\frac{3}{4}$ Limousin (LM) and $\frac{1}{4}$ to $\frac{3}{4}$ AN or AR, also with a maximum $\frac{1}{8}$ unknown or other breed genetics.

Summary

The release of gene dominance when genetically dissimilar cattle are mated results in heterosis. Paternal heterosis in hybrid bulls has been evidenced in improved semen characteristics and earlier breeding dates. The development of hybrid and composite bulls in today's beef industry provides a tool to commercial cattlemen to take advantage of breed complementarity while reaping additional benefits associated with paternal heterosis.

New Member of the Rippe Gelbvieh Team

Michael Rea joined the Rippe Gelbvieh team in August of 2011. Michael grew up in Berthoud, CO and graduated from Colorado State University with a double major in Animal Science and Agricultural Business. At CSU he was very active in Livestock & Meat judging in addition to the Seedstock Team. Growing up Michael and his family had a registered Gelbvieh herd. They produced several National and Reserve champion females in addition to selling bulls on our sale. Michael is very knowledgeable and passionate about the cattle industry. He knows our cowherd as well as anyone so please call or look him up sale day with any questions you have.



Cattle Market Update

The cattle market has been in a bull market for 25 months and it has been a heck of a ride for EVERYONE involved. The farmer, cow-calf producer, feedlot, & packer have all experienced huge profits. Despite a \$45/cwt rally in fed cattle prices there are still reasons to be bullish. Outstanding gains in the feedlot have masked a very current supply of fed cattle in the feedlots. Export demand has been outstanding, but if the dollar continues to rise will that go away? U.S. demand continues to be average but good enough with solid exports.

The most bullish item continues to be the feeder cattle market. US

and global cowherd continues to liquidate. Will we stop liquidating in 2012? Possibly, but that would mean at least 3 more years before an increase in meat production would hit the market place. What worries me being in the feedlot industry is that the feeder cattle industry is very current and feeder cattle supplies will not be there during February thru June. We have ways of measuring how current the fed cattle industry is, but the data is not as clear in the feeder cattle market.

What concerns me the most is the volatility I feel we are

going to see in both the feeder and fed markets. If 2012 is a normal seasonal year we should see a \$300 swing in fed values. That is \$24/cwt change during the course of the year. This would equate to around a \$45/cwt swing in feeder cattle values or \$350/hd.

It will be more crucial in the future for cow/calf producers to begin incorporating risk management into their business. A \$350/hd variance per year can mean the difference between making or losing money that year. **In my opinion, cow calf producers are especially vulnerable when they only market their entire production on one day of the year.**

Rippe Gelbvieh

WE ARE ON THE WEB AT
RIPPEGELBVIEH.COM



Mission Statement:

"To produce superior Gelbvieh and Balancer seedstock based on economically important traits, which provide more profitability for our customers, and ensure the consumer a very satisfying eating experience."

"The most effective way to cope with change is to help create it."

L. W. Lynett

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