



CATTLEMAN'S CHRONICLE

Spring Newsletter

2019

Vol. 21

Don't Underestimate the Value of a Crossbred Cow

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Those of you who were able to join us for the 48th Annual American Gelbvieh Association (AGA) National Convention in Nashville, Tennessee, got a good refresher on the value of crossbreeding in Dr. Darrh Bullock's presentation at the Cattlemen's Profit Roundup. If you were unable to attend convention, I'd encourage you to watch the entire presentation, which is available on the AGA Facebook page. AGA's registry of Balancer® cattle shows that as a whole, the Gelbvieh breed values the use of crossbreeding. However, even those of you breeding purebred and fullblood animals have the opportunity to discuss the value of crossbreeding with your customers, including potential benefits of keeping replacements when your bulls are used on English-based cows. Making use of the two pillars of crossbreeding, breed complementarity and heterosis (hybrid vigor), can have a huge impact of profitability for commercial users of Gelbvieh and Balancer genetics.

First, let's consider that there are three genetic factors that affect efficiency and profitability of beef operations:

- 1) The characteristics of the animals produced- having marketing goals and producing a calf crop that most optimally meets those goals.
- 2) Hybrid vigor (both direct and maternal).
- 3) The characteristics of the sires and dams- there are ways it makes sense to design a breeding program. Choose females that are well suited to the environment in which they will be expected to produce and select sire breeds to complement them.

Employing crossbreeding can be used to influence all three of these factors. First, let's recall the two primary benefits of crossbreeding: breed complementarity and hybrid vigor.

I believe breed complementarity is pretty straightforward, but hybrid vigor is often misunderstood and its value underestimated. Here are some key items of importance with regard to hybrid vigor:

- It is most impactful for survival and reproductive traits.
- Its benefit tends to be greater for breeds that are more genetically different from each other. For example, there is more expected hybrid vigor in British-Continental crosses than between crosses of only British or only Continental breeds. The largest impact of hybrid vigor is expected in Bos indicus-Bos taurus crosses.
- It tends to be proportional to the degree of heterozygosity.

The use of crossbred females is especially important because some of the largest impacts are on traits related to female productivity (maternal ability and reproduction). Crossbred females are expected to have a younger age at puberty, a quicker return to estrus postpartum, more longevity in the herd as well as being superior for most other measures of fertility. This is called

direct hybrid vigor.

In addition, calves born to crossbred dams benefit from the fact that their dam is crossbred, which gives them both added survivability and growth. This is referred to as maternal hybrid vigor and is in addition to any hybrid vigor that calf expresses directly.

As an example, in the early '80s the Meat Animal Research Center (Cundiff et al., 1982) designed a system to illustrate the value of crossbreeding. First, they compared weaning rates and weights of crossbred vs straightbred calves when both were raised by straightbred dams (this would show the value of direct hybrid vigor). Then they compared weaning rates and weights of crossbred calves when they were raised by either crossbred or straightbred cows (this would show the value of having a crossbred dam, which equates to maternal hybrid vigor). Results are shown below:

Crossbred calves weaned at 3 percent higher rate, and weighed 4.6 percent more when straightbred dams raised them, and as a result, the system producing crossbred calves benefited with 8.5 percent more pounds of calf weaned per cow exposed.

When compared to the system using straightbred cows, the system using crossbred cows had 14.8 percent more pounds of calf weaned per cow exposed. Finally, when the straightbred system was compared to the system using crossbred dams to produce crossbred calves 23.3 percent more pounds of calf weaned per cow exposed was achieved. I should note, that the crosses were for Angus, Hereford and Shorthorn. So, even greater benefit could be expected between Gelbvieh and British crosses.

Trait	Direct Hybrid Vigor	Maternal Hybrid Vigor	Total Hybrid Vigor
Weaning %	3.0%	6.4%	9.4
Weaning Weight	4.6%	4.3%	8.9%
Lbs weaned/cow exposed	8.5%	14.8%	23.3%

When comparing straight breeding systems using purebred females to crossbreeding systems using crossbred females: Over half of the advantage of crossbreeding systems can be attributed to the use of crossbred cows. I hope this helps arm you with information to have discussions regarding the value of not only utilizing Gelbvieh and Balancer bulls, but the value of retaining crossbred females should not be underestimated.

TERMINOLOGY:

Breed Complementarity → The strengths of one breed being used to complement another.

Hybrid Vigor → (aka heterosis) the higher performance of crossbred animals as compared to the purebred average.

Direct Hybrid Vigor → the boost in performance in the calf due to the calf itself being crossbred.

Maternal Hybrid Vigor → the improvement in calf performance because it has a crossbred dam.

Source: American Gelbvieh Association



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