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Value-Added Solutions

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Mother of the Year

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Many cow-calf producers spend a lot of time researching and selecting bulls, which is easily justified, since bull selection may be the single largest influence on genetic improvement in their herds. However, managing the genetic makeup of the cow herd, although somewhat more difficult, can produce similar rewards.

One of the easiest management factors to employ in your cow herd is maternal heterosis, which can be thought of as the added advantage in the so-called mothering ability that a crossbred cow has over the average ability of her purebred parents. For example, a crossbred cow will typically produce more milk than her parents' breeds did on average. Maternal heterosis is a little more difficult to measure than individual heterosis, since it is expressed only in females. Heterosis is the release of inbreeding depression that has resulted from breed formation and is accomplished when animals

from two breeds are crossed. All breeds of animals are slightly inbred, which is why members of a breed have similar characteristics.

A review of several crossbreeding experiments (Long, 1980) showed that crossbred cows had a 9 percent advantage in calving rate

and an 8 percent advantage in calf weaning weight over their straight-bred counterparts. A similar review (Gregory and Cundiff, 1980) reported a 14.8 percent advantage in calf weight weaned per cow exposed to breeding and credited it to maternal heterosis. Research conducted by the USDA's Agricultural Research Service at the Meat Animal Research Center showed that Hereford x Angus cows remained in the herd an average of 1.9 years longer than the Hereford or Angus parent lines. The crossbred cows produced 1.3 more calves and 766 pounds of additional calf weight over the course of their lifetime. A summary of three other studies showed that lifetime production (measured in pounds of calf weaned) of Bos taurus x B. taurus cows was 25 percent higher than that of their straight-bred counterparts. Using B. indicus (e.g., Brahman) cattle in a crossbreeding system can further increase the magnitude of heterosis, especially in subtropical climates (Cundiff and Gregory, 1999). Other production variables, such as age at puberty or cull cow weight, may be improved by heterosis.

Let's put some economics with these production figures. Assume Herd A is a straight-bred cow herd that averages an 80 percent calf crop and a 525-pound weaning weight. The calf weight weaned per cow exposed is 0.80×525 , or 420 pounds. We will assume calves

are worth 100 dollars per hundred-weight, so gross revenue for Herd A is 420 pounds x 100 dollars per hundred-weight, or 420 dollars per cow. Now, let's say that Herd B uses crossbred cows (parent breeds' production traits are similar to those of the straight-bred



cows in Herd A). Management programs and bulls are similar between the two herds. Herd B will show a 14.8 percent increase (Gregory and Cundiff, 1980) in calf weight per cow exposed because of maternal heterosis. Therefore, Herd B's calf weight per cow exposed is 420×1.148 , or 482 pounds. The calves from these cows will be a little heavier and therefore won't be worth quite as much per pound, so their selling price is reduced to 95 dollars per hundredweight. Herd B's gross revenue is 482×95 dollars per hundredweight, or 458 dollars per cow. Herd B took advantage of maternal heterosis and grossed an extra 38 dollars per cow exposed!

If the average straight-bred cow produces six calves in her life, each averaging 525 pounds, and those calves are worth 100 dollars per hundredweight, then that cow's lifetime gross revenue is $6 \times 525 \times 100$ dollars per hundredweight, or 3,150 dollars. If that cow is crossbred, she could produce 25 percent more calf weight in her lifetime (Cundiff and Gregory, 1999). If she produces seven calves and they wean at 560 pounds, then her lifetime production is 3,920 pounds. Again, those heavier calves will be worth a little less, so her gross revenue is $3,920 \times 95$ dollars per hundredweight, or 3,724 dollars. Maternal heterosis kicked in again, this time resulting in an advantage of 574 dollars per cow over the cow's productive lifetime. The figures can change some, depending on which percentage advantage you use, but it is apparent that crossbred cows can potentially put some extra dollars in your pocket.

There is a downside, however. Maintaining another herd to pro-

duce your own crossbred replacement heifers is most likely going to be difficult to justify for all but the largest operators. However, buying your replacement heifers is usually more economical than raising them anyway, so that may not be a downside after all. Using a composite breed (e.g., Santa Cruz, Stabilizer, the MARC composites, or Noble Line) allows a producer to have the simplicity of a straight breeding system and retain some heterosis at the same time.

A word of warning: maternal heterosis is not an excuse to monogrelize your herd. Heterosis is most effective in a planned breeding system that uses top-quality base genetics.

In summary, consider using some form of a crossbred cow in your operation. No single breed excels in all aspects of beef production. Using crossbreeds will allow you to take advantage of heterosis and breed complementarity.

Crossbred cows: they're money in the bank.

References

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