Crossbreeding in a beef herd

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Crossbreeding

Crossbreeding is the production of crossbred animals. A crossbred animal has ancestors from more than one bred.

Heterosis

Heterosis, hybrid vigor, or outbreeding enhancement, is the improved or increased function of any biological quality in a hybrid (crossbred) offspring

Breed Complementarity

Crossbreeding programs can be designed to utilize the unique strengths of maternal and paternal breeds and minimize the weaknesses of individual breeds.

Crossbreeding beef cattle offers two primary advantages relatives to the use of only one breed

1. Heterosis
2. Breed Complementarity

Heterosis occurs when the performance of the crossbred progeny exceeds that of the average performance from the parental breeds. Figure 1, shows how crossbred performance exceeds the average performance of both parents. However, crossbred animals are not always the best performing animals. As an example, Figure 2 shows that even with 5% heterosis, the crossbred animals are not better than both straight breed parent means.

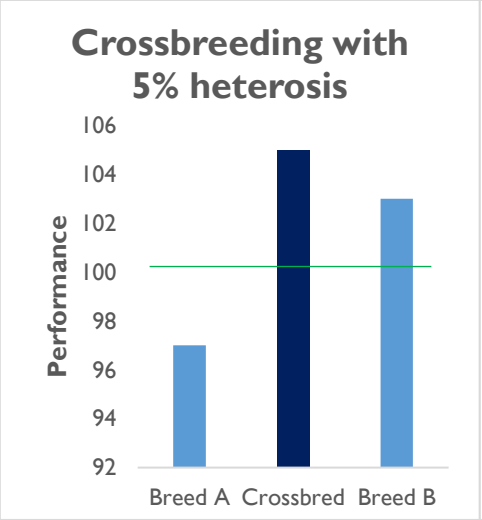

Figure 1 crossbred performance exceeds only one straight bred

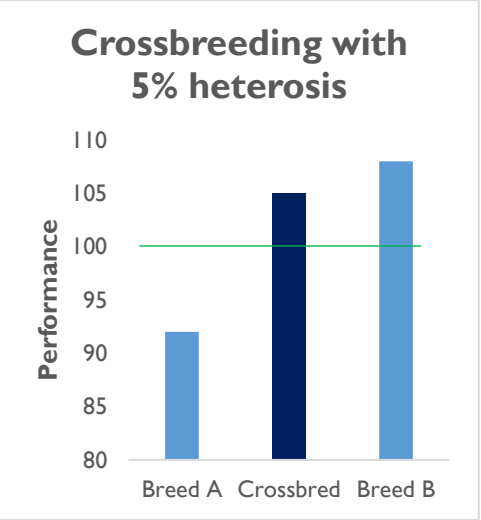

Figure 2 Crossbred performance exceeds both straightbreds

Heterosis can have an effect on several economically important traits. In general, traits with the lowest heritability values usually have the greatest amount of heterosis, while traits with the highest heritability values usually have the lowest amount of heterosis.

The performance of some traits is improved when the mother of an animal is crossbred. Maternal heterosis measures the heterosis expected from a crossbred mother compared to a straight breed mother. We expect maternal heterosis for traits where the mother has an opportunity to significantly influence the performance of her progeny. Maternal Heterosis is usually important for traits involving early growth and survival. It is also possible to have traits that are influenced by the crossbreeding of the sire (paternal heterosis), these usually included traits involving the process of conception.

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Table 1 shows how heterosis can improve calf growth and survival traits.

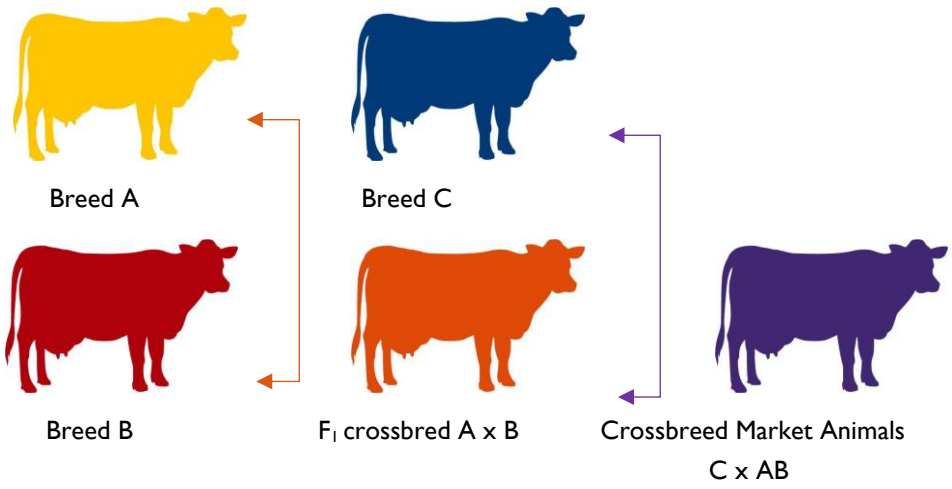
Table 1

Trait	Heterosis Percentage *Individual*	*Maternal*
Calving Percentage	3.4	6.6
Birth Weight	2.7	1.6
Weaning Weight	4.7	4.2
Post-Weaning ADG (feedlot)	3.9	-1.4
Post-Weaning (pasture)	6.4	
Yearling Weight (feedlot)	3.8	2.9
Yearling Weight (pasture)	4.5	

Table 1- Long, C.R. 1980. Crossbreeding for beef production. J. Anim. Sci. 51:1197.

Crossbreeding can be structured to take advantage of the unique qualities of two or more breeds. Some breeds may excel in maternal traits but may not be as strong for growth traits. Other breeds may excel in growth and carcass traits but may not be strong for maternal traits. Crossbreeding programs can be designed to utilize the unique strengths of maternal and paternal breeds and minimize the weaknesses of individual breeds by taking advantage of breed complementarity. Breed Complementarity can be utilized by purchasing males from dam breeds to produce female replacements. The female replacements would benefit from the dam breeds superior mothering ability or milk production. Males from sire breeds would be purchased to produce market animals. The market animals would benefit from the superior growth or carcass characteristics of the sire breed.

Terminal Crossbreeding System



There are many ways to incorporate crossbreeding into your beef herd but an ideal crossbreeding program should 1) optimize, heterosis in both the calf crop and particularly the cow herd, 2) utilize breeds and genetics that fit the feed resources, management, and marketing systems of the operation, and 3) be easy to apply and manage. - AY