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“Beef Production Strategies” article

Inbreeding and Linebreeding

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Have you heard the old saying used when mating a bull to his daughters, sisters, dam, or other relatives, “if it works the calf is linebred and if it doesn’t the calf is inbred”? The saying is often times thrown around among purebred cattle producers, when they have mated two close relatives, either intentionally or by mistake. When these producers think about linebreeding, it is usually looked at as favorable – this bull is linebred to _____, a famous bull from recent years. However, if we say this bull’s sire is also his grandsire and basically is a brother-son to his dam, well, that sounds like an inbred mess. Who wants that?

Linebreeding and inbreeding have their places in beef cattle production. In fact, linebreeding is a form of inbreeding. One of the most successful instances of line breeding resulted in one of the most popular and widely used Angus bulls of all time, N Bar Emulation EXT. EXT was the result of the mating of two paternal siblings. Like most management techniques the use of these practices should be a part of a planned breeding system and not managed haphazardly. With the price of bulls climbing across the nation and the yearning to retain replacement heifers, there could be a few farmers who might think about mating their current herd sire to his daughters to stretch out a bull for “one more year”. Personally speaking, I tend to side with the anti-inbreeding mindset in commercial cattle systems. However, there are times in which it is just not feasible to purchase a new bull. I get that. Below are some food for thought when considering mating a sire to his daughters, sisters, dam, or other relatives.

When inbreeding occurs, genes can become concentrated. There are times when it can work amazingly well and there are times it ends in disaster. Let’s say you have a bull who happens to be a carrier of an unknown lethal recessive genetic defect, UG (for simplicity). Your bull, like all carriers of UG, appears to be perfectly normal. However, animals that are affected (homozygous recessive) with UG, die shortly after birth. When this bull is mated to non-relative cows who are free of the genetic defect, UGF, approximately 50% of the resulting offspring will be UGF, while the other 50% will be carriers of the UG defect, UGC. Now, consider mating this bull to his daughters: the probability of having an affected calf rises to 12.5%. Furthermore, roughly 57% of the surviving daughters out of daughters will be carriers of the defect. As the gene frequency increases in the herd, the likelihood of having affected calves also increases. You are probably asking, what is the chance of gene mutating and resulting in a case, like UG – very slim. The point is, in the slim chance your bull was a carrier of a recessive genetic defect, it would be more likely to show up if you mated him to his daughters.

We have all made mistakes when planning a mating in our cattle herds, especially those who utilize artificial insemination. I recall once thinking that if I mated a certain bull to my favorite cow that the resulting calf would certainly be a contender for grand champion at the Alabama Jr. Beef Expo Angus show. This resulting calf would trace 4 times to a well-known bull. It made a lot of sense, two outstanding phenotypes in the parents and stacked genetics would surely result in a great one. Boy was I wrong! I anxiously waited 283 days for a knot of calf. The only growth genes apparent in this particular calf was those for hair. The best part about the cattle business is that we can sell our mistakes by the pound!

Crossing two inbred lines of cattle can have a similar outcomes to crossbreeding. With that said if you have a favorite breed of bull, and you utilize that breed every year in your herd choosing non-relatives as sires could be advantageous. In my opinion, true linebreeding and inbreeding should be left up to seedstock producers who have a well-designed breeding plan. As a commercial cattle producer, avoid inbreeding if you can.

I hope you have made plans to attend the Beef Improvement Federation Annual Convention and Research Symposium, June 9-12, in Biloxi. Please look me up if you are there. If you would like to contact me, my email address is cobie.rutherford@msstate.edu and phone is 662-325-4344.

For more information about beef cattle production, contact an office of the Mississippi State University Extension Service.