Repro Tracks

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Advising bull buyers on use of bulls

The sale of a bull is often the beginning rather than the end of a relationship between an Angus breeder and a commercial cattleman. One question often posed to breeders by their bull customers is, "How many cows can this bull breed?" Having a good answer may mean the difference between success that leads to a repeat customer or the failure that sends the customer elsewhere. Understanding the breeding capacity of the bull and anticipating management problems are the keys to offering good advice.

Breeder question No. 1

I often get questions from commercial cattle producers who buy my Angus bulls about the right "stocking rate" or number of bulls needed to breed a group of cows. I am concerned that if I quote too small a number of cows that can be served by one bull, the customers will think I'm just trying to sell them more bulls. What is the right number?

Response: The appropriate bull-to-female ratio to quote a commercial producer depends on the age of the bull, the size and terrain of the breeding pasture, as well as the reproductive history of the cow herd. The traditional recommendation has been a bull-to-female ratio between 1-to-20 and 1-to-30 with the more conservative ratio (1-to-20) being commonly recommended when using yearling bulls. When I checked seven sources found by doing a quick Internet search, the most common recommendation was 1 bull to 25 cows. However, every source placed specific qualifications on their recommendations.

Scientists affiliated with three different universities [Clemson University, University of Florida and Colorado State University (CSU)] have indicated they thought current bull-to-female ratios used by commercial beef producers were too conservative and that commercial producers could purchase fewer bulls without suffering a decrease in the pregnancy rate of their herds. Scientists at each university stated or implied that the bull-to-female ratio could be increased from 1-to-20 up to 1-to-40 or 1-to-50 for bulls that passed a breeding soundness exam within 60 days prior to the breeding season and had been successful in getting most of the cows in the herd pregnant during the first 30 days of the breeding season the previous year. One researcher suggested bulls be started at the traditional bull-to-female ratio of 1-to-25, but then he recommended an "increase of five to 10 cows per bull per year until pregnancy rates decline or you can't sleep at night, whichever comes first!"

I agree with the university scientists who claim we are underestimating the breeding capacity of the average Angus bull. Research from CSU that reported yearling bulls breeding estrus-synchronized heifers ejaculated an average of 55 times during a 30-hour observation period convinced me that bulls have far more libido than most cattlemen believe. You could argue that after multiple ejaculations bulls breeding large numbers of cows in heat "run out" of viable sperm. However, research on repeated collections of bulls in an artificial insemination (AI) stud suggest that while initial ejaculates contain more sperm cells per ejaculate (4 billion to 8 billion), the number of sperm per ejaculate levels out at half a billion to a billion per ejaculate after three or four successive ejaculates. Recent studies with frozen semen numbers as low as half a million sperm per insemination have resulted in satisfactory fertility. Therefore, an ejaculate containing a half billion fresh sperm should have a good chance of getting a cow pregnant.

While the university researchers may be correct and the industry may have been too conservative in assigning bulls to breeding pastures in the past, *caution* is still in order. Nobody wants to recommend using fewer bulls only to have a commercial producer suffer a big decrease in his next calf crop.

After reading multiple opinions on the subject, I suggest you recommend every bull be tested for breeding soundness and young bulls begin breeding at the traditional 1-to-25 bull-to-female ratio. However, I believe the recommendation of increasing the cows bred per bull per year by at least 10 or 15 should be followed if the bull is retested for breeding soundness and he got most (greater than 60%) of the cows in the herd pregnant during the first 30 days of the breeding season the year before.

Breeder question No. 2

I have 70 commercial cows and have been using three Angus bulls I purchased two years ago to breed them. One of my bulls got hurt, and I sold him as a cull bull. Can I purchase a "new" 18-month-old bull and turn him out with the two older bulls I have been managing together for the past two years?

Response: Mixing bulls of different ages can create numerous problems. The first and most obvious potential problem is the risk of injury during the establishment of a social dominance order ("pecking order") among the bulls. The two older bulls you own have been together and have an established social dominance order. It is most likely that if you introduce a new, younger bull into the group, the younger, lighter bull will be subordinate to the two older, dominant bulls. Establishment of the dominance order may involve fighting among the bulls. All the bulls are at risk of injury if they fight, but the young bull is likely to be the subordinate and may have the greatest risk of injury.

If the bulls are mixed it should be in a pasture that allows as much room as possible for the young bull to get away from the older bulls, not in a corral where the subordinate bull can be cornered. Some breeders recommend that a new, young bull should be introduced when the older bulls are preoccupied with a change in their location or some other management change that allows the introduction of the new bull to be just one of several changes that occur simultaneously.

None of the producers I talked to claimed 100% success at introducing new bulls to a group without problems. Most indicated the new bull should be left in the pen with the others if he is just being annoyed or harassed and not physically injured by the social dominance behavior. However, if the subordinate bull is being injured, he has to be removed.

The other problem with introducing a younger, subordinate bull into a breeding pasture is that the dominant bull will not allow the young bull an equal chance to mount and breed cows in the herd. The older, dominant bull is likely to do the majority

of the breeding, and, therefore, is likely to sire the greatest proportion of the calves. In a five-year study, investigators recorded the percentage of calves sired by each of four bulls mated each year to a large group of cows. The bulls varied in age from 2 to 10 years old throughout the study. They reported that a single dominant bull sired 62% to 70% of the calves born in the herd each year.

Therefore, in your case, don't expect to introduce a new, young bull and have him sire many calves as either of the two older bulls you own. The dominant bull will guard the cows in heat each day and prevent the subordinate bull from mounting and breeding. Cows make this process easier by grouping together when they come into heat. In the study cited above, the bull that was lowest in the social dominance order sired only 6% to 12% of the calves each year.

If you have a choice, it would be better to split your cows and allow the older bulls to breed one group, while the younger bull breeds a separate group. Another alternative is to buy a group of young bulls that are all the same age to replace your whole bull battery. Groups of same-age bulls managed together in one breeding pasture have a more complex social dominance order and are more likely (but not guaranteed) to share the breeding more evenly.

Editor's Note: *Bill Beal is a beef cattle reproductive physiologist at Virginia Tech. He conducts research involving estrus synchronization, artificial insemination, embryo transfer and the use of ultrasound technology. If you have questions or comments related to the reproductive management of cows or bulls, contact him at wbeal@vt.edu.*