BY THE NUMBERS

by Kelli Retallick, Angus Genetics Inc.

Male Fertility: The Forgotten Trait

"We have all heard the saying, 'Money isn't everything,' and then we have also heard the reply, 'It is if you haven't got it.' I'm sure the same is true about beef cow fertility."
— John J. Winninger, 1971.

Getting cows pregnant is a large economic driver for any beef cattle operation. The number of calves weaned per cow exposed can be the difference between profit or loss for a beef cattle enterprise.

Cow fertility is a key component to this measure of success. Postpartum interval, age, body condition score (BCS), dystocia, nutrition and genetics all play a role in cow fertility.

Producers stress to get each piece right. In the fall, pregnancy checks are done, and open cows get the boot. At that point in time, if the cow is not pregnant, her fertility is blamed for her lack of success. Although, what about male fertility?

Male fertility

It seems, at times, male fertility has become "the forgotten trait." Even though breeding soundness exams (sometimes referred to as a BSE) are performed before turnout and adequate bull-to-cow ratios are calculated in the data-driven world that is today, why aren't more tools available to select for male fertility?

Research conducted by Magee reported an average breeding soundness exam failure rate of 33% in 2005. This failure rate not only affects how often a commercial producer needs to replace a breeding bull, but it also has significant financial implications on seedstock producers.

A breeding soundness exam cannot be accurately assessed until 1 year of age. At that point in time, several hundreds of dollars have already been invested to develop a bull. What if it was possible to identify those bulls at greater risk of breeding soundness exam failure earlier in life?

Through a collaboration with Kansas State University (K-State), the Angus breed is exploring this opportunity. The goal is to harness data already available within the industry and streamline pipelines for data submission to the American Angus Association.

The research aims to collect information taken during a breeding soundness exam before sale day or before turning out natural-service sires to breeding pastures. Information to be collected would include:

1. Collection date,
2. Scrotal circumference,
3. Motility (% or class),
4. Volume,
5. Concentration,
6. Percent normal or abnormal,
7. Pass/fail status, and
8. Reason for failure.

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Once collected, this information would be used to identify characteristics of this data.

Is it heritable? If it is, how should it be modeled? Is it possible to genetically select for a higher percentage pass rate?

Decreasing the percentage of breeding soundness exam failures prior to sale day will increase a seedstock producer's bottom line. Tools available today, including scrotal circumference (SC) expected progeny differences (EPDs), help to mitigate a portion of the risk associated with breeding soundness exam failures at a year of age.

Selecting for higher SC EPDs increases the genetic potential of a sire's sons to have larger scrotal size than their contemporaries, which is one part of the Pass/Fail criteria when conducting a breeding soundness exam.

Other than scrotal size, no other male fertility traits have been used to develop tools for male fertility. On the other hand, selection tools to increase female fertility have existed for some time.

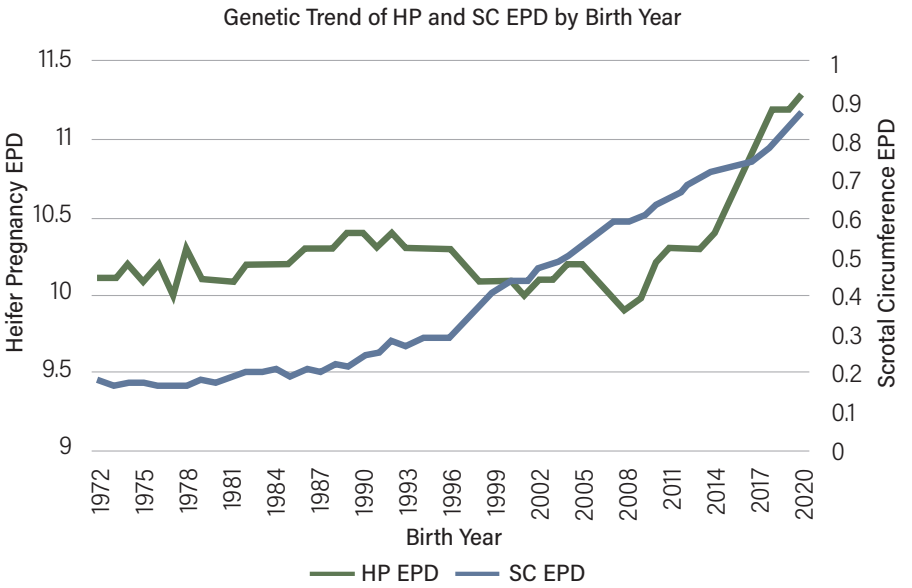
Does improving female fertility improve male fertility?

Individual metrics, like heifer pregnancy (HP) EPD, have played a role in increasing pregnancy rates among virgin heifers. However, research has shown a low correlation between male and female fertility.

Look at the genetic trends behind Angus's SC and HP EPDs in Figure 1. These genetic trends illustrate heifer pregnancy did not show a positive genetic trend until HP EPD tools were released after 2008.

However, an increased genetic trend in SC EPD can be seen over the past several decades. This supports that a low correlation, at least between available fertility measures, exists. If the correlation between these two traits was high, the genetic trends would mimic each other more closely.

Figure 1: ***Genetic trends in heifer pregnancy and scrotal circumference EPDs.***



The reality

Based on previous K-State research using artificial insemination (AI) stud data around motility, morphology and semen concentration, genetic selection for increased male fertility appears probable. However, using on-farm breeding soundness exam information still has its own nuances.

First, variation among veterinarians exists when collecting this data. Secondly, limited data and knowledge is available in this area. These factors make this type of work both exciting and challenging as this path begins to be explored.

One thing is for certain: without data, no progress can begin to be made. Information on how to submit breeding soundness exam records and data recording spreadsheets can be found online.

If you have any questions on how to submit these breeding soundness exam records to be utilized in this research, reach out to AGI. AJ

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Editor's note: For questions, contact the AGI customer service team at 816-383-5100.