SORTING GATE

Risk mitigation and genetic selection

by Kelli Retallick-Riley, Angus Genetics Inc.

Every business must deal with internal and external risks. Agriculture is no different. To manage risk it is vital to make sure the individuals running the outfit understand what the potential problems could be so they can create solutions for those problems and mitigate risk.

Risk mitigation in agriculture many times includes diversification of enterprises within an individual operation and/or production contracts. For risk beyond our control, like the weather, many will purchase crop insurance or invest in new technologies.

How do you manage risk for your cow-calf operation?

Steps to a genetic solution

Genetics can be a real solution to mitigate risk and improve profitability. Implementing genetic solutions is done in a stepwise process.

First, individuals must set an instinctive breeding goal for themselves. In most cases understanding how and when the calf will be marketed will set the direction for this breeding objective.

Second, get a grasp as to where the genetic efficiencies and deficiencies may lie. This can be done by keeping records on pregnancy rates, performance weight records, or recording the percentage of assisted births. If detailed records have not been taken to this point, simply reflect on what has and hasn't worked in prior years.

Finally, with that information in hand, you can start to apply genetic selection tools that can make a difference.

The heifer pregnancy EPD focuses on a sire's daughter's ability to get pregnant in her first breeding season. The higher the HP EPD, the more favorable.

PHOTO BY SHAUNA HERMEL

Heifer pregnancy

For instance, if during your time of reflection, you have lower-than-desired pregnancy outcomes, focus on traits like the heifer pregnancy (HP) expected progeny difference (EPD) to work toward a solution. Even though fertility traits are categorized as lowly heritable, genetic progress can still be made. Coupled with the right management procedures, fertility rates can be improved.

Heifer pregnancy in particular focuses on a sire's daughter's ability to get pregnant in her first breeding season. The higher the HP EPD, the more favorable, because you are increasing the probability the sire's daughter will conceive in the first breeding season.

Getting that heifer pregnant at this point in her life is a pivotal moment. This decides whether she makes it into the breeding herd and whether the investment you made in that young female will pay off.

Take Bull A, who has a HP EPD of +15, and Bull B, whose HP EPD is a +10. When comparing Bull A's daughters to Bull B's, one would expect, on average, that Bull A would produce daughters that have a 5% greater chance of becoming pregnant compared to Bull B. In other words, if a producer had 100 females sired by Bull A and 100 females sired by Bull B, one would expect, on average, five more pregnant females sired by Bull A compared to Bull B.

Table 1: No. of progeny required to reach the same amount of accuracy in the EPD as provided by a DNA profile

Angus EPD trait	Progeny equivalent
Calving ease direct	25
Calving ease maternal	19
Birth weight	23
Weaning weight	27
Yearling weight	22
Yearling height	15
Dry-matter intake	11
Scrotal circumference	13
Docility	11
Foot claw set	13
Foot angle	13
Pulmonary arterial pressure	17
Hair shed score	8
Heifer pregnancy	17
Maternal milk	35
Mature weight	14
Mature height	9
Carcass weight	14
Marbling score	10
Ribeye area	16
Backfat thickness	13

Calving ease

Another way to mitigate risk is to reduce the incidence of calving difficulty on your operation. Calving difficulty leads to increased labor and veterinary costs, limits calf vigor, delays estrus, and increases the risk of death.

Most bulls destined to be bred to heifers are selected for calving ease direct (CED) EPD. This is the tool of choice to choose a bull to mate to heifers to decrease calving difficulty.

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Using a similar example to the one above, if Bull A has a +8 and Bull B has a +13 CED EPD, and both bulls are mated to 100 heifers, we would predict, on average, 5% fewer assisted births out of Bull B.

While CED tends to get all the glory, if you are keeping replacement females out of your own herd, the calving ease maternal (CEM) EPD is the tool to select the sires of the females a commercial cow-calf operation may want to keep. This EPD is the female's own maternal ability to lay down and have her calf. Building CEM into your cow herd provides an additional layer of risk management when it comes to calving season.

Even though risk mitigation may not be the most attractive topic to tackle in your business, it is one that can save a lot of heartache and add profitability to your bottom line.

Increase accuracy

While the genetic level, or the EPDs, of the bulls you buy can provide a level of risk mitigation for your herd, it is also important to understand the levels of accuracy that are behind those EPD predictions.

Accuracy gives producers a sense of how much information is included in the calculation. Accuracy values range from 0-1. Only highly proven artificial insemination (AI) sires that have thousands of progeny recorded in the Association's herd book reach accuracies close to 1. However, many bull suppliers capture as much information as they can on a young bull prior to sale time.

Each bit of information collected helps to improve the accuracy of EPD predictions. For instance, CED EPD accuracy is increased by suppliers capturing information on the calving event, whether any assistance was given or by sending in birth weight information.

Another large factor to EPD accuracy of young stock is the inclusion of genomic (DNA) testing. These tests can greatly increase the information that is available to inform on a young bull that has not yet had the opportunity to produce progeny of his own. In fact, on average, the accuracy of a young bull with no other information at the Association besides his pedigree/parent-average EPD increases his EPD accuracy, on average, by 560% for CED.

What's that mean in real life?

Having a bull that is genomic-tested prior to purchase is like already having the same amount of information driving that CED EPD as 25 calving ease progeny records. That means that having a genomic-tested bull is like having a bull with the same amount of accuracy as he would after his first calf crop has hit the ground. Talk about risk mitigation.

Table 1 (see page 38) shows each individual trait and the number of progeny equivalents required to reach the same amount of accuracy a young bull has after being genomic tested.

In summary

Even though risk mitigation may not be the most attractive topic to tackle in your business, it is one that can save a lot of heartache and add dollars to your bottom line. Genetic selection is not just a tool to drive improvement in traits targeted through your breeding goals; it is also handy in mitigating unwanted consequences.

To learn more about individual traits or EPDS, feel free to visit *https://www.angus.org/Nce/Definitions* or call the Association at 816-383-5100 to request the latest *Sire Evaluation Report*.

Editor's note: Authored by AGI staff, "Sorting Gate" is a regular *Angus Beef Bulletin* column featuring herd improvement topics for commercial producers using Angus genetics. For additional information on performance programs available through the American Angus Association and AGI, *visit www.angus.org* and select topics under the "Management" tab.